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ABSTRACT

The impact of the Health Professions Educational Assistance Act of 1976 (P.L. 94-484) on the supply of physicians for the armed services was assessed. As background to the survey findings, information is presented on conditions of three federal programs and differences in their benefit structures and implications for program participation. These programs are the Armed Forces Health Professions Scholarship Program (AFHPSP) of the Department of Defense (DOD), the National Health Service Corps (NHSC) scholarships of the Department of Health, Education, and Welfare, and the Federal Loan Insurance Program. The 1977 survey of a sample of first and second year medical students evaluated their preferences regarding the alternative financing methods, using the conditional logit model to simulate future choices. The demographic variables included race, sex, marital status, and family contribution, and policy variables included the discounted present value of income in each life-cycle period. Attention is directed to implications of the results for current and future anticipated changes in AFHPSP participation, given no program changes, and cost effective program changes to attain a goal of about 1,200 physicians per year. The results suggest that the DOD will fall short of its requirements for medical AFHPSP accessions by about 400 per year after 1978 if there were full NHSC funding for all its qualified applicants. The analysis suggests that increasing service compensation by about $7,500 (1978 dollars) would eliminate the shortfall and will probably be more cost effective than offering a stipend beyond that offered by NHSC. Adjustment strategies for the AFHPSP program benefits are outlined, and a sample questionnaire and description of the survey procedures are appended. (SW)

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Medical Student Financing and the Armed Forces Health Professions Scholarship Program

Victoria Daubert, Daniel Relles, Charles Roll, Jr.

January 1982

Prepared for the
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PREFACE

The research described in this report sought to assess the impact of the Health Professions Educational Assistance Act of 1976 (P.L. 94-484) on the supply of physicians for the armed services.

The principal source of physician procurement for the Department of Defense is the Armed Forces Health Professions Scholarship Program (AFHPSP) authorized by the Uniformed Services Health Professions Revitalization Act of 1972 (P.L. 92-426). The intent of this scholarship program was to replace the draft and the Berry Plan, as well as other scholarships for selected health professionals. (The Berry Plan was a draft-motivated deferment plan for medical school graduates. It allowed them, at the services' option, to enter and complete residency training in return for two years of active duty military service following their residency training.) From its inception, the program proved to be successful in attracting the desired number of medical students, largely because AFHPSP was competitive with alternative methods of financing a medical school education. The Health Professions Educational Assistance Act changed this situation dramatically by offering equally (or more) attractive scholarships to medical students on a sufficiently large scale. As a result, the continued success of the AFHPSP in meeting DoD physician requirements was seriously jeopardized.

The research reported here provided a basis for estimating the type, direction, and magnitude of adjustments in AFHPSP benefits necessary to maintain the program on a competitive level with other scholarship programs. The research should also be of use in providing a method for gauging the effects of policy changes where historical data can provide no evidence. In 1980 the Special Pay Bill for Health Professionals (PL-96-286), incorporating many of the recommendations resulting from this research, was signed into law.

This work was sponsored by the Assistant Secretary of Defense for Health Affairs (Contract No. MDA903-77-C-0273).

SUMMARY

The principal source of physician procurement for the Department of Defense since the end of the draft has been the Armed Forces Health Professions Scholarship Program (AFHPSP), authorized in 1972. As a result of subsequent legislation authorizing HEW's National Health Service Corps (NHSC) scholarships, the competitive position of the AFHPSP has been eroded. This report describes the analysis of a sample survey of medical students, carried out in late 1977. The purpose of the research was to analyze survey responses to recommend benefit changes to ensure that AFHPSP would remain a viable source of physician procurement. The empirical results derived from the survey of first and second year medical students suggested that DoD would, after the transition to full NHSC funding, fall short of its requirements for medical AFHPSP accessions by about 400 students per year. The analysis also suggested that increasing service compensation by about $7,500 (1978 dollars) per year would fill the shortfall. As the empirical evidence has testified, the prediction was accurate.

ACKNOWLEDGMENTS

This work was initiated and carried through survey stages by former Rand colleagues William H. Albright and David S. C. Chu. The authors wish to thank them for their efforts. John J. McCall and Susan D. Hosek provided helpful comments on the final draft of this report.

Lieutenant Commander Eleanor S. Matheson was project monitor for this research effort. Throughout the life of the project, her support, encouragement, and constructive review were deeply appreciated.

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I. INTRODUCTION

In late 1972 the Congress passed the Uniformed Services Health Professions Revitalization Act (P.L. 92-426) and thereby established the Armed Forces Health Professions Scholarship Program (AFHPSP). The AFHPSP was directed at one of the most difficult problems to face the military services because of the end of the draft—the procurement of physicians.

Through the AFHPSP, the military departments are authorized to award scholarships to medical students and students in specified allied health fields who will accept a year of obligated active-duty service for each year of scholarship support. The AFHPSP has become one of the most important sources of physician manpower for the Department of Defense. From its inception to 1977, the program was to be successful in attracting the desired number of medical students. AFHPSP's initial recruiting success, however, took place in an environment where the financial alternatives available to medical students, although better than in the early 1960s, were limited. This situation changed dramatically when, in 1976, the Congress passed the Health Professions Educational Assistance Act (P.L. 94-484). The financing alternatives for medical education now available to students under this Act—through the expanded National Health Service Corps Scholarship Program (NHSC) and the new federally insured student loan program—were offered on a scale large enough to potentially affect the market for medical school financing.

What were the future prospects for the AFHPSP in this new situation? How should DoD react? What changes might DoD consider for the AFHPSP? To help answer these questions, The Rand Corporation conducted, in late 1977, a sample survey of first and second year medical students. The survey was designed to assess the effects of P.L. 94-484 on the AFHPSP and to identify changes in the program which would restore its attractiveness at least cost. We found that, in the long run, AFHPSP faced a significant shortfall in its recruiting objectives. Our results suggested that increasing service compensation was the most cost effective policy option to achieve the desired number of AFHPSP recruits. This report describes the survey and presents these findings.

Following a problem statement in Section I, Section II describes the conditions of the AFHPSP, NHSC, and federally insured student loan programs and discusses their potential impact on the market for medical school financing. Section III describes the survey instrument and the survey methodology. The methodology described in this report is potentially applicable to analyzing a wide set of program change effects where historical data are not able to provide insight. Section IV presents the analysis and results of the survey. Based on these results, Section V outlines alternative adjustment strategies for the AFHPSP program benefits. Appendixes A through D describe the medical student survey procedures and the survey itself.

II. CONDITIONS OF THE PROGRAMS AND CHANGES IN THE MARKET FOR MEDICAL SCHOOL FINANCING

This section describes the conditions of the three federal programs—AFHPSP, NHSC, and federal loans—and identifies those differences in their benefit structures likely to affect student preferences: the effective level of the stipend and the postgraduate training opportunities. Finally, we consider the resulting implications for participation in AFHPSP, and indicate how our research sought to address these implications.

PROGRAM DESCRIPTIONS

The AFHPSP Program

Public Law 92-426, the Uniformed Services Health Professions Revitalization Act of 1972, established the Armed Forces Health Professions Scholarship Program in order to generate an adequate supply of active-duty commissioned officers who are qualified in designated health professions. At any one time the program provides for a total of 5,000 scholarships in the fields of medicine, osteopathy, dentistry, veterinary medicine, optometry, podiatry, and clinical psychology (at the Ph.D. level). Most scholarships are awarded to medical students. Participants in the program are appointed as commissioned officers in the reserve components of the Armed Forces.

Eligibility. To be eligible for participation in the AFHPSP a candidate must (1) be a United States citizen; (2) meet the requirements for appointment as a reserve commissioned officer; and (3) be enrolled or accepted for enrollment at an accredited educational institution in the United States or Puerto Rico in a designated health professions training program. In addition, the candidate must sign a contractual agreement which binds him (or her) to (1) complete his education as a member of the program; (2) accept an appropriate reappointment or designation in the health professions; (3) participate, if selected, in an internship of the sponsoring military service; (4) participate, if selected (based on his specialty choice), in a military residency program, or be released from active duty for the period required to undertake a civilian residency if selected by the sponsoring military service for such training; (5) participate in prescribed military training; and (6) complete the military active duty obligation.

Military Active Duty Obligation. For program participation of two years or less there was a military obligation of two years. Participation in excess of two years resulted in an additional active-duty obligation of six months for each additional six months or less of scholarship support.

The period of time during which an internship and/or residency training is completed does not count toward the obligated service period.

Regardless of any higher reserve grade held, program participants must serve on active duty in the grade of second lieutenant/ensign with full pay and allowances for 45 days during each 12-month period of participation in the program. The salary during the obligated service period averaged $22,000 per year in 1977.

The new physician pay bill (P.L. 96-284, 28 June 1980) revised the pay provisions for medical officers in the Armed Forces. It increased the salary for HPSP physicians with one year of postgraduate training to $33,000 per year, including bonuses and allowances. The

salary for HPSP physician specialists with three or four years of residency training is about $38,000 per year for the first one or two years and about $43,000 for the remaining years of obligated service. All graduates are entitled to complete one year of postgraduate training, and about 50 percent may complete their residency training before beginning their active-duty obligation.

Stipend and Educational Expense. The original legislation authorized a stipend of $400 per month for 10.5 months per year. As of 1 June 1981, the stipend was raised to $530. In addition to the stipend, program benefits cover all educational expenses such as tuition, fees, books, laboratory and educational service expenses, and equipment rental.

Students in the AFHPSP during AY 1973-1974 and AY 1974-1975 originally incurred a federal tax and social security liability on the stipend of $40 to $60 per month. This liability was removed by temporary legislation enacted by the Congress on 24 October 1974, which expired on 31 December 1975. Subsequent temporary legislation has been passed four times to maintain the tax exempt status of the scholarship for students entering the program prior to January 1980. In 1980 the Congress enacted legislation to permanently resolve the tax status of the AFHPSP. It called for taxation of the stipend only, and only for students entering the program after 31 December 1980. To compensate these students for the tax, legislation is now pending to increase the amount of the stipend by the amount of the tax liability.

The NHSC Program

The Public Health Service's National Health Service Corps (NHSC) is competitive with the AFHPSP. It provides financial support for full-time students enrolled in any nationally accredited U.S. school of medicine, osteopathy, dentistry, or (1977-1978) baccalaureate nursing. NHSC participants are employed by the federal government for a period of obligated service to help relieve the professional staffing needs of Public Health Service direct patient-care programs in medically underserved areas of the United States.

Eligibility. Applicants to the program must (1) be citizens of the United States; (2) be enrolled or accepted as full-time students in an accredited educational institution for medical, osteopathic, dental or nursing education in the United States or any of its possessions or trust territories; and (3) have no competing service obligation.

Service Obligation. Scholarship recipients are obligated for one full year of service for each academic year or part of an academic year for which scholarship support was received, with a minimum service obligation of two years. Participants serve as NHSC employees in federally designated Health Manpower Shortage areas in the United States and are assigned to urban or rural areas, public or private non-profit medical facilities, or population groups at the discretion of the NHSC. In 1977, the salary during the obligated service period averaged $22,000 per year, including allowances. At present, the initial salary, which is inflation protected, has increased to about $38,000 for General Medical Officers with one year of postgraduate training. Board-certified specialists receive an additional $2,000. All graduates may elect to complete up to three years of postgraduate training before beginning their service obligation.

Stipend and Educational Expenses. In 1977, participants in the program received a stipend of $429 per month for twelve months each year. This stipend is protected against inflation by a cost of living increase provision. (The stipend was $530 as of 1 June 1981.) In addition to the stipend, the program covers tuition, fees, equipment rental, and other reasonable educational expenses.

In 1977, the tax status of the scholarship was uncertain. Students who entered the program prior to January 1977 (our sample) were to be exempt from federal taxation on all scholarship funds through 1979. Beginning in 1980 students would very likely be liable for federal, and in some cases, state income taxation on the full amount of their scholarships (stipend, tuition,

and fees). In 1980, the tax status of NHSC scholarships was resolved to permanently exempt all fees and tuition. The stipend will be taxed beginning in 1981.

The Loan Insurance Program

The Federal Program of Insured Loans aids graduate students in Health Professions Schools who can demonstrate exceptional financial need. The program provided a maximum of $10,000 per year, up to $50,000 per student. Loan funds were available to cover tuition, plus a maximum of $2,500 to cover other reasonable educational expenses, including fees, books, and laboratory expenses. Loan funds did not cover living expenses.

Loan principal is repayable over a period of 10 to 15 years, starting 9 to 12 months after completion of training (including internship and residency training), except during service in the Armed Forces, the National Health Service Corps, or the Vista Volunteer Program. Interest is payable by the recipient throughout the life of the loan at a rate not to exceed 10 percent. Students may elect to have their loans plus interest forgiven at a rate of up to $10,000 per year for each year of service in the National Health Service Corps or in private practice in a designated Health Manpower Shortage Area. Students who elect this option must serve a minimum of two years.

DIFFERENCES IN BENEFIT STRUCTURES

Competitive Status of the AFHPSP

At the time of the study, the National Health Service Corps Scholarship Program had more attractive features than the AFHPSP in at least two of its benefit provisions: the stipend and the postgraduate education provisions. They were equal in the length of the required obligated service period. The difference in the stipend has since been eliminated, and the postgraduate training provision, which guarantees students only a 50 percent chance of entering and completing residency training, has in fact proved to be far more liberal as the services' demand for specialists increased.

Through the Health Professions Educational Assistance Act, the NHSC scholarship program expanded significantly. Funding of the Public Health Service scholarships (PHS), which NHSC programs are designed to replace, had been limited and had not been a serious threat to the AFHPSP. In addition, PHS scholarships had been awarded primarily to students in their third year of medical school, whereas AFHPSP participants were generally first or second year students at the point of entry into the program. In FY 1978, the first full year of the NHSC scholarship program, $60 million were appropriated. Of this, $48.6 million (81 percent) were set aside for medical and osteopathic students, with selection priority given to applicants entering their first and second year of medical school. At an average annual amount of $10,000, this new level of funding could provide for 4,860 scholarships.

The Senate-House Conference Agreement on HEW Health Appropriations for FY 1979 included $75 million for NHSC scholarships, of which $60.75 million could go to medical and osteopathic scholarships. (P.L. 94-484 authorized up to $75 million in FY 1978, $140 million in FY 1979, and $200 million for FY 1980.) In the extreme, this could have resulted in funding for 16,000 medical and osteopathic scholarships in 1980, or 25 percent of the student population. As a result, AFHPSP was competing for participants against a program which had superior benefits and the ability to absorb, at the 1978 funding level, all scholarship recipients under the old PHS program as well as all potential AFHPSP applicants.

At present, however, the status of the NHSC program is being reviewed by the Reagan Administration. Although the new proposed budget would fund those students already in the program, it would award no new scholarships for the coming year.

The loan insurance program also clearly had the potential to affect the medical school financing market, although to a lesser extent because of its restrictions and inferior benefits. It was very different from NHSC and HPSP, neither offering a stipend nor tying participation to exceptional financial need or a service obligation.

The Effective Level of the Stipend

Investment in education differs from other types of investments in the difficulty of capitalizing its potential earnings. For the medical student this means that, while he (or she) can look forward to many years of high earnings capability, he must satisfy current monetary demands (living and education) out of current assets. For many this is difficult. The AFHPSP allows future earnings to be converted into current assets by the obligation of future services.

The AFHPSP is attractive because it offers coverage of living as well as educational expenses. However, while the nominal value of its stipend has remained constant, the effective value was decreasing because of inflation. The purchasing power of $400 (1978 dollars) is about $265 (1972 dollars). Thus, the effective before-tax value of the stipend had declined to 66 percent of its original value and, given the rate of inflation in 1978, it was expected to decline still further. (Recent changes in the stipend are discussed in Sec. II.)

The NHSC stipend has always been protected against inflation by an annual cost of living increase.

A second (potential) factor in the decline of the effective value of the stipend was the tax provision which might apply to both the AFHPSP and the NHSC program. This provision would have had a differential impact, hitting hardest those students who attend high tuition schools. As described above, this uncertainty has been resolved.

Opportunity for Graduate Medical Education

If chosen, AFHPSP participants are obligated to enter military service upon graduation from medical school. Since at least one year of graduate medical training (GME 1 or internship) is prerequisite for independent medical practice, this training will have to be provided through either military or civilian training programs. Entry to active duty may be deferred for students completing a civilian internship.

Since training beyond GME 1 (residency) is not necessarily required, the military departments have the following three options:

1. The AFHPSP physician may be chosen for a military or military-sponsored residency, with the time spent in training not counted against his active-duty service commitment.
2. The AFHPSP physician may, at the services' option, defer entry to active duty until after completion of a civilian residency.
3. The AFHPSP physician may be required to serve his active-duty service commitment immediately upon completing GME 1.

From the viewpoint of the military services, allowing all AFHPSP physicians to take residency training immediately after internship would have exacerbated the physician supply problem in the short run. The most severe physician shortage was expected for the end of the seventies, when most Berry Plan enrollees would have completed their obligated service

period. (The Berry Plan was a draft-motivated deferment plan for medical school graduates. It allowed them, at the services' option, to enter and complete residency training in return for two years of active duty military service following their residency training.) Allowing all AFHPSP participants to complete residency training would mean that the first AFHPSP physicians would not start full medical practice until three to five years after graduation from medical school; i.e., well after 1980. Furthermore, because of the way Berry Plan deferments for graduate medical education worked, the ratio of specialists to general practice physicians in the military services was expected to increase until the end of the decade. (The actual experience differed because of the civilian procurement program for volunteer physicians, which primarily provides general practitioners.) Consequently, the services had adopted a policy of allowing residency training before serving the AFHPSP commitment only in those specialties for which a requirement existed.

From the perspective of the AFHPSP student, at least some residency training is prerequisite to medical practice, as evidenced by the fact that nearly all medical school graduates pursue some postgraduate medical training beyond internship (GME 1). This investment in graduate training partly reflects the belief that GME 1 training alone does not adequately prepare physicians for independent practice.[1] Moreover, the practice of a physician without residency training differs from that of the specialist. By being able to deny the AFHPSP participant the opportunity to complete residency training before entering active duty, the services can force the young physician either to interrupt his training or to temporarily accept a type of practice that he might not have chosen for himself. Thus, one would expect participation in the AFHPSP to be sensitive to the program's stated residency policy.

In contrast to the AFHPSP, the NHSC scholarship program guarantees each participant the opportunity to pursue up to three years of postgraduate training before beginning the obligated service period. This provision, in addition to allowing the physician to complete a significant portion of his medical school training, eliminates a great deal of uncertainty and facilitates career planning and family life. It is more likely to affect those students planning to enter specialties with shorter residency requirements (e.g., family practice, general practice).

Other Attractive NHSC Provisions

The NHSC program offers a number of options to scholarship recipients which are not available to the AFHPSP members. These include:

1. The option to enter into an alternative agreement, after completion of training, to serve all or part of the service obligation in private practice (or as an employee of an entity providing health services) in a Health Manpower Shortage Area which has a priority for assignment of NHSC personnel, has a sufficient financial base to sustain such a practice, and provides an income at or above the income of a NHSC member.
2. The opportunity for recipients who demonstrate exceptional promise for medical research to fulfill their service obligation under the the National Research Service Award Program.
3. For scholarship recipients who complete their full service obligation with the NHSC, special one-time grants to aid in starting a private practice in a Health Manpower Shortage Area which has a priority for assignment of NHSC personnel, has a suffi-

[1]G. M. Carter et al., *Federal Manpower Legislation and the Academic Health Centers: An Interim Report*, The Rand Corporation, R-1464-HEW, April 1974, p. 33.

cient financial base to sustain such a practice, and provides an income at or above the income of a NHSC member.

4. Recipients will not be subject to military duty in the event of a national emergency during their period of obligated service as commissioned officers of the NHSC.

COMPETITIVENESS OF AFHPSP

In the face of its successful history, was concern for HPSP's continued role as the major source of physician manpower to the armed services justified?

In 1974, Rand conducted two surveys under Air Force auspices. All Air Force AFHPSP participants in their first or second year of medical school were questioned about their attitudes toward the program and the information they had received about it.

A second survey was administered to a random sample of first and second year medical students. This survey focused on students' attitudes toward military service compared with civilian practice, their knowledge of the AFHPSP, and their potential response to the AFHPSP as currently authorized and under alternative conditions. The findings were that participation in the AFHPSP was sensitive to the effective level of the stipend, the opportunity for postgraduate medical education, and the length of the obligated service period.

The need for the survey which is the basis of this report arose from the changed medical school financing market facing scholarship students. This second survey was necessarily more complicated than the first, for the analysis had to take account of more options. Because our results are based on survey data, whatever predictions are made must be tested against reality.

It is useful to indicate where this survey study falls along the spectrum of empirical research.[3] At one end there is the "back of the envelope" analysis on which most policy decisions are probably justified. In the best of circumstances, this type of analysis is based on economic theories that have been subjected to repeated tests, and the predicted sign of the changes resulting from the recommended policy should be correct. At the next level are decisions that require more than qualitative guidance even when there are no historical data. A survey is conducted and with good luck a careful study emerges. Now we have quantitative estimates, but they must be treated gingerly until the appropriate historical data are collected, especially when the survey data are based on answers to hypothetical rather than retrospective questions. Next, there are studies based on historical data that are, as a rule, superior to studies that rely on hypothetical survey data. Finally, there are the "experimental studies" that are presumably the most informative of all empirical research in the social sciences.

The present study is one of survey responses and attempts to provide experimental data where no historical data were available. This experimental method predicted very well and should be of use in other applications. In addition, such analyses have the benefit of data that are uncontaminated by side constraints as are historical data.

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[3]The authors are indebted to J. J. McCall for this categorization of our research.

III. SURVEY METHODOLOGY

In 1977, Rand conducted the medical student survey to generate a body of data which could be used to evaluate student preferences regarding several alternative financing methods—the AFHPSP, the NHSC Scholarship Program, and the Federal Loan Insurance Program. In particular, we wanted to study how modifying the conditions of these programs might affect the relative participation rates in the AFHPSP and NHSC programs.

The survey was mailed to 3,400 medical students expected to graduate in FY 1980 and FY 1981. The sample was supplied to Rand by the American Medical Association. Its sociodemographic characteristics match closely those of the general medical student population.[1] In addition, a sample of osteopathic students was surveyed.[2]

The survey was designed to answer four questions regarding the future of the AFHPSP:

1. If the conditions of AFHPSP had remained unchanged, what would have been the effect of the Health Professions Educational Assistance Act on AFHPSP participation? Each respondent was asked to rank simultaneously four alternatives for financing his (or her) medical school education: AFHPSP, NHSC, the loan program (LOAN), and the student's current method of financing (OTHER).[3] Evaluation of these simultaneous rankings allowed estimates of AFHPSP participation for alternative funding levels of the AFHPSP and the NHSC Scholarship Program.
2. Which conditions in the AFHPSP should be changed to keep the AFHPSP as a major source of physician manpower for the military services? Twenty-six alternative structures of the AFHPSP were evaluated by first and second year medical students. The alternatives included modifications in (a) the level of the stipend, (b) the service compensation, and (c) the postgraduate training policy. Each student was asked to rate a subset of 4 of these modified benefit structures. To accomplish this, 12 separate versions of the survey were distributed.
3. Just as conditions of the AFHPSP might change in the future, so might changes occur in the NHSC Scholarship Program or the loan program. To ensure that the results of this survey would not be invalidated by these changes, the third question concerned the effect of possible changes in these programs on participation in the AFHPSP. Respondents were asked to evaluate potential alternative benefits in these programs compared with the AFHPSP, again in a stratified manner so that each respondent evaluated only four alternatives.
4. The final question was on the relationship of individual characteristics to student preferences for financing their education. These data on respondent demographic characteristics provided information on potential procurement problems and sources of applicants. Respondents' medical practice intentions indicate the kinds of medical specialties which may be most difficult to man in the future. Respondents' views of military medical practice provide the Services with an opportunity to initiate positive changes or to alleviate misconceptions through recruiting efforts.

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[1]Excluding undeliverables, the response rate was 62.25 percent.

[2]A total of 792 osteopathic students at 10 colleges were given questionnaires through their schools. The response rate was 25 percent.

[3]For approximately 6 percent of respondents the current method of financing was expected to be AFHPSP.

In the following section, we describe our analysis of the survey data. The analysis attempts to estimate program participation as a function of program and demographic characteristics.

Because the data were derived from a survey, we estimated unconstrained supply curves, uncontaminated by demand constraints which often confuse historical data. Inherent in such analysis is the fundamental assumption that medical students would choose programs of financing on a life-cycle basis. That is, not only would participation be conditional on financial incentives during medical school years, but also on the anticipated earnings to be received after residency training.

IV. STATISTICAL MODELS AND METHODOLOGIES

THE CONDITIONAL LOGIT MODEL

The problem of analyzing the choice behavior of individuals confronted with a finite set of mutually exclusive alternatives arises in a wide variety of contexts. The conditional logit technique, recently popularized by McFadden,[1] has become a widely accepted approach. Recent applications include studies of choice among institutions of higher education (Radner and Miller),[2] transportation modes (Charles River Associates),[3] and occupations (Schmidt and Strauss).[4]

The conditional logit model focuses on dependent variables that identify which of a set of alternatives was chosen by each individual in a group. It postulates that every individual first evaluates the utility of each alternative available to him, then selects the alternative for which the utility is largest. In practice, the utility function is assumed to be linear in parameters that describe the individual and the alternatives; it also includes an additive random disturbance term from a specific family of distributions. Such restrictions are necessary for tractible estimation procedures.

In our case, there are four alternatives, each defining a different method for medical school financing: NHSC, HPSP, LOAN, and OTHER. The utility functions depend on the projected income streams under each program, additional program incentives, and the individual's wealth, race, sex, and marital status:

$$U_{ij} = b'X_{ij} + e_{ij} ,$$

where i = an index of individuals,

j = an index of alternatives, identifying NHSC, HPSP, LOAN, and OTHER,

U_{ij} = utility (or score) of jth alternative to ith person,

b = (p by 1) vector of unknown coefficients,

X_{ij} = (p by 1) vector of attributes of jth alternative to ith person,

e_{ij} = random error.

The goal of the analysis is to estimate b, thereby identifying the attributes of alternatives that affect choices and quantifying the magnitude of their effects. We also seek a method for simulating future choices which is consistent with the above formulation.

General principles of statistical analysis prescribe that one first write down the likelihood function of the observed data. The maximum likelihood estimates generally have good classical and Bayesian properties, and the inverse of the log likelihood function's second derivatives matrix approximates the estimates' variances and covariances.

In conditional logit estimation, the only distribution on the random disturbances that leads to a closed form and tractible likelihood function is the Weibull distribution:

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[1]Daniel McFadden, "Conditional Logit Analysis of Qualitative Choice Behavior," in P. Zaremba (ed.), *Frontiers in Econometrics*, New York: Academic Press, 1973, pp. 105-142.

[2]Roy Radner and Leonard S. Miller, *Demand and Supply in U.S. Higher Education* New York: McGraw-Hill, 1975.

[3]Charles River Associates, Inc., *A Disaggregated Behavioral Model of Urban Travel Demand*, Final Report to U.S. Department of Transportation, Contract No. FH-11-7566, March 1972.

[4]Peter Schmidt and Robert P. Strauss, "The Prediction of Occupation Using Multiple Logit Models," *International Economic Review*, Vol. 16, June 1975, pp. 471-486.

$$\text{Prob}(e < t) = \exp[-A^*\exp(-Bt)] \text{ , } A, B > 0 \text{ .}$$

The class of Weibull distributions is quite rich, admitting a variety of error density function shapes for various choices of A and B.

Given the Weibull assumptions, McFadden[5] derives an expression for the probability that individual i chooses alternative j:

$$P_{ij} = \text{Prob(individual i chooses j)}$$

$$= \exp(b'X_{ij}) \,/\, \sum_k \exp(b'X_{ik}) \text{ .}$$

Hence, a sample of n students making choices c(1), c(2), . . ., c(n) yields the closed-form likelihood function

$$L(b) = \prod_1^n [\exp(b'X_{i,c(i)}) \,/\, \sum_k \exp(b'X_{ik})] \text{ .}$$

This function has been studied extensively by many authors besides McFadden (cf. Theil,[6] Haberman,[7] Nerlove and Press),[8] and its numerical properties are well-known. It has a unique maximum, and the Newton-Raphson iteration technique generally finds the maximum quickly. Inference statistics include the maximum likelihood values themselves, the log likelihood function (useful in tests of hypotheses), and the inverse of the second derivatives matrix (for confidence intervals).

In our empirical work, we postulated several alternative formulations for the X's, fit the parameters by the maximum likelihood methods, and tested for the importance of terms using likelihood ratio tests. We examined signs of fitted coefficients to verify that the fits were compatible with theory; for example, income elasticities had to be positive. Finally, we used the fitted models to simulate choices of individuals, and verified that the percentages predicted for each option were roughly compatible with empirical flows. These steps are described in the subsections below.

ESTIMATING CONDITIONAL LOGIT PARAMETERS

Choice of Variables

We assume that utility levels depend on two kinds of variables: demographic characteristics of the person and attributes of the choices. The demographic characteristics include race, sex, marital status, and wealth. The choice attributes consist of each program's pecuniary and nonpecuniary incentives. The latter are obviously related to program choice: the greater the incentive, the higher the probability of participation. The demographic characteristics generally serve as intercept variables to set overall levels of program participation: for

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[5]McFadden, op. cit.

[6]Henri Theil, "A Multinomial Extension of the Linear Logit Model," *International Economic Review*, Vol. 10, October 1969, pp. 251-259.

[7]Shelby J. Haberman, "The General Log-Linear Model," Ph.D. dissertation, The University of Chicago, September 1970.

[8]Marc Nerlove and S. James Press, *Univariate and Multivariate Log-linear and Logistic Models*, The Rand Corporation, R-1306-EDA/NIH, December 1973.

example, one might expect that the greater one's wealth, the less likely he is to choose any program with an obligated service requirement.

The demographic variables race, sex, and marital status were entered into the model as dummy variables indexed by program. This essentially sets intercept terms for the probability of participation in each program. The demographic variable "family contribution" was also indexed by program, accounting for the tendencies of wealthier persons to prefer one type of program over another. As in ordinary linear regression, it is necessary to control for the demographic variables to insure that the estimated responses to policy-controlled parameters are not simply measuring general levels of preference for a specific financing method.

Policy variables included in the model were the discounted present value of income in each life-cycle period, plus indicators of whether the programs with obligated service periods payback were offering nonpecuniary incentives during the residency and obligated service periods. Estimating separate coefficients by life-cycle stage allows for a varying evaluation of the value of money. This would be necessary to test the view that medical students are willing to suffer financially during their tenure in medical school—more important are the large monetary rewards in later years.

The Data Matrix

In the conditional logit approach, the specification of the data matrix requires a complete description of each alternative available to each student. Thus, the matrix of independent variables is dimensioned 4 by p, where p is the number of elements in the vector b. To accommodate an intercept term that fixes the level of participation for each alternative, three rows in the X matrix are required. The first row indicates whether the alternative is of the NHSC type; it is (1,0,0,0) if the current method of financing is not NHSC, and (1,0,0,1) otherwise. The second row indicates whether the alternative is of the HPSP type; it is (0,1,0,0) if the current method is not HPSP, and (0,1,0,1) otherwise. The third row indicates whether the alternative is of the LOAN type; it is (0,0,1,0) if the current financing method does not include a loan, and (0,0,1,1) otherwise. A fourth row indicating whether the alternative identifies some other method of financing would be redundant; without loss of generality, its coefficient is set to zero (i.e., the variable is excluded from the model). Similarly, to set intercept values that may depend on personal characteristics, one would identify an indicator of the personal characteristic and interact it with program indicators above.

Table 1 defines the list of variables used in fitting the first and second year students' models, respectively. The first year student variables are as described above. The second year list of variables contains these, plus others indicating which program the student is currently enrolled in. This controlled for an expected tendency of students to support their current program.

Tables 2 and 3 contain fitted conditional logit coefficients for the first and second year students. The coefficients may be interpreted as yielding the log-odds for preferring one program over another: for example, if the vectors x(N) and x(H) describe options for certain variants of NHSC and HPSP programs, predicted log-odds for NHSC versus HPSP would be b′(x(N) − x(H)). The demographic variables allow these odds to mimic actual variations in the sampled population. The program parameter variables (INCSCH, INCOBL, INCPOST, N.BENFIT, and H.BENFIT) indicate how program offerings affect log-odds: for example, Table 2's INCOBL coefficient of 3.8784D-05 implies that a $10,000 difference in obligatory service compensation would increase the log-odds between two programs by 0.387, or an odds increase of 1.47.

There are several interesting facts to observe. First, all program income coefficients are positive, compatible with the notion that more generous programs will increase the likelihood of participation. For both first and second year students, the first period income coefficient is

Table 1

VARIABLES IN MODELS OF CHOICE BETWEEN MEDICAL SCHOOL FINANCING ALTERNATIVES

Variable	Definition (NHSC, AFHPSP, LOAN, OTHER)
NHSC	(1,0,0,0) if the current method of financing does not include a public health services fellowship, (1,0,0,1) otherwise
AFHPSP	(0,1,0,0) if the current method of financing does not include an AFHPSP scholarship, (0,1,0,1) otherwise
LOAN	(0,0,1,0) if current method of financing does not include a loan, (0,0,1,1,) otherwise
OTHER	(0,0,0,1) if current method of financing is none of the above, (0,0,0,0,) otherwise
BLACK	indicator of race, interacted with NHSC, AFHPSP, LOAN
FEMALE	indicator of sex, interacted with NHSC, AFHPSP, LOAN
MAR	indicator of married, interacted with NHSC, AFHPSP, LOAN
WEALTH	income from own earnings and savings, from spouse, and from family gifts and loans, interacted with program indicators NHSC, AFHPSP, LOAN, OTHER
INCSCH	value of the scholarship during medical school tenure—tuition, educational expenses, and stipend, by program alternative
INCOBL	income during obligated service period after graduation, by program alternative
INCPOST	projected income during postservice period, by program alternative
N. BENFIT	indicator of whether program offers NHSC nonpecuniary benefits during postgraduate period, interacted with (1,0,0,0)
H.BENFIT	indicator of whether program offers AFHPSP nonpecuniary benefits during postgraduate period; interacted with (0,1,0,0)
	Second Year Students Only
OWN.NHSC	indicator of which programs are of the NHSC type, and whether the student is enrolled in such a program: (1,0,0,1) if currently holding a public health services scholarship, (0,0,0,0) otherwise
OWN.AFHPSP	indicator of which programs are of the AFHPSP type, and whether the student is enrolled in such a program: (0,1,0,1) if currently holding an AFHPSP scholarship, (0,0,0,0) otherwise
OWN.LOAN	indicator of which programs are loan programs, and whether the student is currently holding a loan: (0,0,1,1) if yes, (0,0,0,0) otherwise

rather small, and considerably smaller than either the second or third period coefficients. This result held for a number of alternative specifications under a variety of statistical tests, and, as we discuss below, it has some important implications for policy. If additional monetary incentives are being contemplated, they should probably be in the form of additional compensation during the obligated service period rather than in additional stipend income during medical school. Finally, the nonpecuniary options seem to induce strong responses toward the armed services program: offering the students the opportunity to shape their obligated service period more than doubled their participation probabilities. The policy relevance of such a finding is clear: service-related inducements should be more broadly advertised so as to make students aware of the various options available during military service.

Table 2

MAXIMUM LIKELIHOOD ESTIMATES OF COEFFICIENTS IN THE CONDITIONAL LOGIT MODEL OF MEDICAL STUDENT CHOICES: FIRST YEAR STUDENTS

	Variable	Coefficient	Estd. Std. Dev.	T
1.	N.WEALTH	2.1209D-05	1.8661D-05	1.1365
2.	H.WEALTH	1.2440D-05	1.9503D-05	0.6378
3.	L.WEALTH	1.8184D-05	1.9156D-05	0.9492
4.	O.WEALTH	1.8904D-05	1.9293D-05	0.9798
5.	INCSCH	9.1940D-06	6.9681D-06	1.3195
6.	INCOBL	3.8784D-05	4.7901D-06	8.0966
7.	INCPOST	5.9421D-05	1.1554D-05	5.1430
8.	N.BENFIT	9.9947D-03	1.7710D-01	0.0564
9.	H.BENFIT	9.8779D-01	2.5177D-01	3.9235
10.	N.BLACK	1.3720D+00	5.4586D-01	2.5135
11.	H.BLACK	1.3109D+00	5.9548D-01	2.2014
12.	L.BLACK	7.7580D-01	5.7089D-01	1.3589
13.	N.MAR	5.4838D-01	5.7704D-01	0.9503
14.	H.MAR	5.1060D-01	6.5588D-01	0.7785
15.	L.MAR	3.0036D-01	6.0862D-01	0.4935
16.	N.FEMALE	-5.8752D-02	3.1458D-01	-0.1868
17.	H.FEMALE	-1.9493D-01	3.5886D-01	-0.5432
18.	L.FEMALE	-1.6233D-01	3.2403D-01	-0.4996
19.	NHSC	-1.5412D-01	3.4573D-01	-0.4458
20.	AFHPSP	-1.7039D+00	3.8639D-01	-4.4098
21.	LOAN	-9.0080D-01	2.3499D-01	-3.8334

SOURCE: Rand, 1977, Medical Student Survey of First Year Students.

NOTE: Sample size, 900; number of parameters, 21. The coefficients (b) provide fitted probabilities for preferring each of the four programs NHSC, HPSP, LOAN, and OTHER. To obtain these probabilities, describe each program in a length-21 vector (x) of student and program attributes, compute exp(b'x) for each of the four programs, then rescale these numbers to sum to one.

Numerous other models were fitted to the data. We tried many different ways to enter the income variables, including the insertion of separate income coefficients for each program type in each period. Observing statistically different coefficients within a time period would imply that the value of money varies by monetary source; in fact, tests of the equality of such coefficients tended to reject that hypothesis, and none of these models significantly improved the fits. We stayed with the present model partly for this reason, partly because it contains relatively few parameters and their patterns are plausible, and partly because the results of simulation were plausible and consistent with reality.

PREDICTION VIA THE CONDITIONAL LOGIT MODELS

Given the characteristics of a student and the attributes of available alternatives, the fitted coefficients may be used to estimate the probabilities that each alternative will be selected. To predict program participation for the first year, of course, we would use the first year coefficients; the probabilities of second year participation would be computed using the second year coefficients and conditioning on first year choices. Consistent with what is observed

Table 3

MAXIMUM LIKELIHOOD ESTIMATES OF COEFFICIENTS IN THE CONDITIONAL LOGIT MODEL OF MEDICAL STUDENT CHOICES: SECOND YEAR STUDENTS

	Variable	Coefficient	Estd. Std. Dev.	T
1.	N.WEALTH	1.9497D-05	3.0510D-05	0.6390
2.	H.WEALTH	4.5586D-05	3.2219D-05	1.4149
3.	L.WEALTH	1.6385D-05	3.1108D-05	0.5267
4.	O.WEALTH	2.4225D-05	3.4527D-05	0.7016
5.	INCSCH	2.0204D-05	1.3749D-05	1.4695
6.	INCOBL	2.9532D-05	7.1171D-06	4.1495
7.	INCPOST	7.0462D-05	1.2065D-05	5.8401
8.	N.BENFIT	7.8887D-01	2.4242D-01	3.2541
9.	H.BENFIT	1.8226D+00	3.6794D-01	4.9536
10.	N.BLACK	-4.8892D-01	9.0661D-01	-0.5393
11.	H.BLACK	-9.4640D-01	9.8420D-01	-0.9616
12.	L.BLACK	-1.3939D+00	9.5025D-01	-1.4669
13.	N.MAR	-5.3258D-01	7.9779D-01	-0.6676
14.	H.MAR	-8.8697D-01	9.0990D-01	-0.9748
15.	L.MAR	-7.5436D-01	8.2532D-01	-0.9140
16.	N.FEMALE	4.1073D-01	4.4045D-01	0.9325
17.	H.FEMALE	-2.0854D-01	5.3019D-01	-0.3933
18.	L.FEMALE	2.4473D-01	4.6570D-01	0.5255
19.	NHSC	-1.5799D+00	5.7961D-01	-2.7256
20.	AFHPSP	-3.3742D+00	6.8633D-01	-4.9162
21.	LOAN	-1.9923D+00	5.3512D-01	-3.7231
22.	OWN.NHSC	1.7610D+00	1.4787D+00	1.1909
23.	OWN.AFHPSP	1.7311D+00	4.4911D-01	3.8546
24.	OWN.LOAN	9.4475D-01	3.5740D-01	2.6434

SOURCE: Rand, 1977, Medical Student Survey of Second Year Students.

NOTE: Sample size, 666; number of parameters, 24. The coefficients (b) provide fitted probabilities for preferring each of the four programs NHSC, HPSP, LOAN, and OTHER. To obtain these probabilities, describe each program in a length-24 vector (x) of student and program attributes, compute exp(b'x) for each of the four programs, then rescale these numbers to sum to one.

in practice, we assume that transitions may occur into, but not out of, NHSC and AFHPSP programs in the second year.

We are not interested in predicting the behavior of one or two students but rather of populations of students. Therefore, we must define each population of interest, quantifying the demographic characteristics of all of its members. This yields a matrix of independent variables describing student characteristics (i.e., the X's). The fitted probabilities are summed over the variables in the matrix to yield the expected number of students choosing each alternative. In constructing this matrix, we assumed that the demographic characteristics of the total population of medical students resembled those of our samples—plausible, since we chose a random sample of students for our surveys. Our projection population was 8.3 percent black, 38.0 percent married, 24.7 percent female, and average wealth within each group (by race, marital status, and sex) was equal to the sampled population average for that group.

Because the level of first period scholarship income depends on tuition, and the first period coefficients are positive, we know that the model will predict higher participation in the higher tuition schools. Because our coefficients on second period income are positive, we know also that greater participation will be predicted for higher compensation programs. Our simulation results are broken down by compensation levels, tuition, and stipend generosity. The main goal of the prediction investigation is to quantify these differences.

One other step in the prediction process is to derive uncertainty estimates for the quantities estimated. After all, the coefficients (b's) produced by the maximum likelihood fitting algorithm have considerable variation due to random response error. We quantify this uncertainty by adopting a formal Bayesian approach: approximating the posterior distribution of b, simulating b, and computing the simulation's averages and standard errors of predicted participation rates.

We performed a crude empirical test of our model, comparing our best estimate of NHSC and AFHPSP accessions with the predicted supply. According to the Office of the Assistant Secretary of Defense for Health Affairs, there were about 1,000 AFHPSP medical student accessions, and just over 3,000 medical student applicants for NHSC, from first and second year classes. Assuming an eligible base of 14,000 first year and 14,000 second year students in four year programs, and 2,130 first year students in three year programs, our base case predictions are 822 and 2,976 respectively, with standard errors of about 200 and 500 respectively.[9] Both predictions are well within the range of uncertainty, but there are enough comparability problems that we still do not consider this a strict test. First, actual AFHPSP accessions included about 66 third year students in four year programs, but did not distinguish between medical and osteopathic students; we estimated that 50 students were included, and accordingly subtracted them from the reported AFHPSP total of 1,046. Second, despite the more than 3,000 applicants to NHSC, only about 2,700 were enrolled in NHSC—what happened to the other 300+ students? Some certainly must have enrolled in AFHPSP, but we have no information on their number. If a third to half of them enrolled (plausible, because those students demonstrated interest in financial aid), much of the difference would be made up. Finally, the NHSC was new in 1977, and participation during that period is unlikely to resemble steady-state participation, to which our model is geared.

In Table 4, we show the base case participation rates across medical school tuition levels. We see that as tuition goes up, so do the probabilities; owing to the rather small coefficient on medical school income, however, we see little variation in participation rates as tuition levels increase. The standard errors of the participation rates are also reported in the table. Generally, we find them to be small, but in considering policy alternatives, we always consider their magnitude. Policy recommendations are generally based on prediction contrasts (i.e., how many more participants do we expect when compensation levels are increased by $5,000 per year?), and we note that the standard errors of contrasts are usually much smaller than standard errors of absolute levels themselves. A useful rule of thumb is to trust prediction contrasts much more than the prediction levels; their value is anywhere from a factor of two to a factor of ten less.

This ends our discussion of empirical results. In Section V, we reconsider the policy alternatives suggested by our prediction model and explore the options available to AFHPSP sponsors.

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[9]Standard errors of predicted enrollments assume that each student's enrollment decision is a Bernoulli random variable; the computations incorporate errors arising from uncertainty in the estimated probabilities as well from the future Bernoulli choice realizations.

Table 4

Predicted Participation Rates, by Tuition Level

Type of School	Tuition Grouping ($)	Participation Rates (%)	
		Estimate	Std. Error
Public	1,445	4.8	1.1
Private	3,007	5.0	1.1
	4,756	5.3	1.2
	5,825	5.5	1.2
	6,785	5.6	1.3
	9,727	6.1	1.4
	All	5.4	1.2
All	—	5.1	1.1

V. LONG RUN PARTICIPATION IN AFHPSP

In the previous section we presented the results of our modeling effort to predict AFHPSP participation. In this section we spell out the implications these results had for (1) current and future anticipated changes in AFHPSP participation, given no program changes, and (2) cost effective program changes to attain an accessions goal of about 1,200 physicians per year.

STEADY STATE PARTICIPATION

Our projection of new participation of medical students in AFHPSP for the long run (based on 1978 benefits) is presented in Table 5, along with our forecast for NHSC participation and the standard errors of the estimates.

Table 5

PREDICTED STEADY STATE AFHPSP AND NHSC PARTICIPATION: NEW OBLIGORS,[a] AY 78/79

Program	Goal	Predicted
AFHPSP	1,200	822 (177)
NHSC	3,000	2,976 (532)

NOTE: Prediction assumed current program conditions in real values. Standard errors are in parentheses.

[a]First year students in three and four year programs; second year students in four year programs.

The projections were derived from unconstrained supply curves that assume no demand effects (e.g., quotas for NHSC specialty participation). In addition, the predictions are characterized as steady state because they assumed the transitory effects discussed in the previous section are no longer present.

What was the outlook for the AFHPSP in future years? If we assume no taxation of stipend or scholarship, no increase in the entering medical student class, and no change in program characteristics, Table 5 shows our long run prediction for AFHPSP participation: chronically short of the goal of 1,200 by about 400 students. However, one exception should be noted. In 1978, the AFHPSP stipend was not inflation protected, whereas the NHSC stipend was. The above projection assumes the real values of both NHSC and AFHPSP stipends would not change. If the AFHPSP stipend had declined in real terms by about 6 percent per year, participation in AFHPSP would have declined by about 1 percent in each succeeding year. This implies that the chronic shortfall would become increasingly larger over time. Moreover, if stipend and tuition were taxed, the shortfall would become even more severe and would involve a distributional shift in private school participation.

We next discuss the taxation issue, and then turn to the question of the relative efficacy of various alternatives to achieve the recruiting goal of roughly an additional 400 AFHPSP accessions per year.

TAXATION OF STIPEND AND TUITION

Scholarship participants in both the AFHPSP and the NHSC programs were not subject to federal income tax on the stipend, the tuition, or the other educational expenses, although the possibility of taxing both programs was often discussed until the tax status was permanently resolved in 1980. Such a tax would have differentially affected students in public low tuition schools and private high tuition schools. At the average 1978 tuition level of public schools ($1,445 per year), the tax for an unmarried student would have lowered the value of the scholarship by approximately $750 per year ($63 per month). At the average level of private school tuition ($5,511 per year), the value of the scholarship would have been reduced by approximately $1,170 per year ($ per month). Thus the effective value of the monthly stipend would have been reduced to $337 per month and $303 per month, respectively, relative to the $400 per month stipend in the absence of the taxation. In spite of these reductions in the effective value of the stipend of 16 percent and 25 percent, the impact of removing the tax liability on the rate of participation was not large. Taxation of both stipend and tuition led to roughly a 4 percent overall reduction in participation. Thus, the survey results suggested that the taxation issue was not one which would significantly affect AFHPSP participation. In addition, had the tax provision for AFHPSP been added, it probably would also have been added for the NHSC program.

However, our results suggested that taxation of tuition would have redistributed the share of scholarship participants from private schools to public schools. Table 6 displays these distributional changes. Taxation implies a larger percentage reduction in private school AFHPSP participation, especially at the higher tuition schools.

However, even if AFHPSP and NHSC scholarships were not taxed and AFHPSP stipends were inflation protected, the Department of Defense would still face a chronic shortfall of AFHPSP participants.

Table 6

PREDICTED PARTICIPATION RATES, BY TUITION LEVEL

Type of School	Tuition Grouping ($)	Participation Rates (%)	
		No Tax	Tax
Public	1,445	4.8	4.7
Private	3,007	5.0	4.9
	4,756	5.3	5.1
	5,825	5.5	5.2
	6,785	5.6	5.3
	9,727	6.1	5.7
	All	5.4	5.2
All	—	5.1	4.9

PECUNIARY OPTIONS TO INCREASE AFHPSP PARTICIPATION

The Department of Defense essentially had two pecuniary options to increase participation in AFHPSP: increase the stipend or increase military compensation. Due to our life-cycle approach, we were able to model the separate effects of increasing either or the joint effects of increasing both. Table 7 presents the results of our simulation on stipend and service compensation increases.

Table 7

PREDICTED PERCENTAGE OF AFHPSP PARTICIPATION AT FOUR LEVELS OF SERVICE COMPENSATION AND FOUR LEVELS OF STIPEND
(First and Second Year Students)

	Stipend			
Compensation	$400	$500	$600	$700
$22,000	5.1	5.3	5.5	5.7
$27,000	6.6	6.9	7.1	7.4
$32,000	8.6	9.2	9.2	9.5
$37,000	11.1	11.6	11.9	12.3

As is not surprising given our coefficient estimates, the table reveals that participation is more sensitive to the level of service compensation than to the stipend. We believe that these empirical results reflect a differing evaluation of income in the two time periods; i.e., the students apparently were not indifferent to equivalent present discounted value dollar amounts in different time periods. Students indicated a preference for high incomes after completion of training. One explanation for this may be found in a life cycle income utility that is not completely associated with physical consumption. Many medical students expect to forgo luxuries and high incomes during their medical school years in return for expected high earnings once they complete their training. In many cases they move almost immediately into a very high paying job. A 1977 physicians' earnings profile in *Medical Economics*[1] reported that 90 percent of all physicians, 81 percent of general practitioners, and 93 percent of family practitioners had incomes over $30,000 after expenses. Median income for physicians in 1977 was $65,430. These figures imply that the AFHPSP physicians during their obligated service are at the low end of the lowest 10 percent of physicians in terms of their earnings, in addition to the relatively low status many of them enjoyed because service residency policies limited their training. The prospect of moving into a low paying and possibly low status job for three or four years while one's peers were earning high fees probably contributed to low AFHPSP participation rates.

The empirical results suggested that increasing active duty service compensation was a more cost-effective means for increasing AFHPSP participation. To achieve an increase of roughly 400 new students per year requires an increase in the level of military compensation to about $7,500 per year for AFHPSP participants during their obligated period of service. This figure was remarkably close to the 1978 physician bonus level. We estimated the budgetary impact of such a change (Table 8 below) under the assumption that all participants

[1] "Doctors' Earnings: Inflation Edges Ahead," *Medical Economics*, September 18, 1978, pp. 226-235.

Table 8

ILLUSTRATIVE BUDGET IMPACT OF AN ANNUAL PAYMENT OF $7,500 TO AFHPSP PARTICIPANTS DURING OBLIGATED SERVICE

Fiscal Year	Expenditure ($ millions)
1979	0
1980	0
1981	0
1982	0
1983	2.9
1984	12.2
1985	21.4
1986	30.0
1987	34.0
1988	34.0

NOTE: Assumes entrance to active duty after one year of internship, and that 392 three year obligors and 840 four year obligors join AFHPSP each year.

would begin to serve their obligation after one year of internship. Of course, actual residency policy and residency lengths would not have yielded such a stream, but would have delayed reaching the steady state expenditure of $34 million for a number of years.

NONPECUNIARY CHANGES IN AFHPSP CONDITIONS

In addition to increasing the income of scholarship participants during medical school or obligated service, there are several options which could be used by the Department of Defense to affect participation in the AFHPSP. The specific options examined in the survey are the following:

1. A 100 percent residency opportunity.
2. The opportunity to complete residency training in a civilian hospital.
3. The guarantee to serve in the area of specialization.
4. The guarantee not to be moved during the obligated service period.
5. Assignment through a matching program similar to the National Internship and Residency Matching Program.
6. Joint assignment with spouse, if both are health professionals.

In our modeling efforts we entered separate dummy variables for each AFHPSP nonpecuniary option listed above. Unfortunately, we did not have enough joint variation on two or more options together to estimate the additive effects of each option being available in the program. Consequently, we collapsed the variables into one indicator of whether or not a nonpecuniary benefit of the type listed above was offered. We could not estimate the added participation to be gained by offering each one of these options, but can only indicate that the effect of offering them is significantly positive.

Some options may be judged by specific individuals to be extremely important; for example, provision 2 allows NHSC physicians to complete a two-year residency following their one year internship, which qualifies them to serve as family practitioners during their obligated service period.

An Association of American Medical Colleges' (AAMC) study found that among 1976 graduates from medical school, 70 percent of those who as applicants had planned to enter primary care practice took first year residencies in a primary care field.[2] In a survey of 1976/77 U.S. medical school applicants, Gordon and Johnson found that 57 percent of those who had decided on a career were planning to enter the primary care field.[3] The proportion of medical students planning to enter primary care careers has been relatively large. In addition to the three year postgraduate training provision offered to NHSC participants, the program has also provided participants with opportunities to go into private practice in a designated shortage area, and in addition it has offered a start-up grant to open such a practice after completion of obligated service. This provision has given a great deal of flexibility to students enrolled in the NHSC scholarship program.

All of the nonpecuniary options we found to be important were related to students' professional development. Residency training has become a necessary prerequisite for nearly all types of medical practice and was perceived as such by the medical students. To deny them this opportunity was viewed as a disruption in their professional development. In addition, it deprives students of the assistance given by medical schools to their students in placing them into residency programs and providing general support. Once a student has been out of the academic system for three or four years, he (or she) may expect to encounter greater difficulty in finding a first-rate residency than at the time of graduation, especially if his training was interrupted after completing only an internship.

The results of this survey suggested that medical students have a strong preference for continuity in their education and for practicing in their area of specialization. The 1974 Rand survey of first and second year medical students also supported our survey findings that the opportunity for postgraduate training is important in determining participation in the AFHPSP.

From the point of view of the military services in 1978, allowing all AFHPSP physicians to take their residency training immediately after their internship would have exacerbated the physician supply problem in the short run; AFHPSP physicians would not have started full active-duty medical practice until three to five years after graduation. In addition, it would have made control over the specialty mix in the services difficult. Still the residency option was probably the most powerful of all the nonpecuniary options open to the military services.

ELIMINATION OF INFORMATION GAPS REGARDING AFHPSP SCHOLARSHIPS

To participate in a scholarship program, it is important that potential applicants be adequately informed about the provisions of the programs, their benefits as well as their requirements. We found that many students were uninformed about practice conditions in the military. Many students had problems obtaining information about the scholarship provisions as well. Some of them stated they received conflicting information regarding scholarship provisions. Other students stated that they never received their scholarship awards until late in the summer, and by then had made other provisions for financing their education. Yet

[2]J. M. Cuca, *Career Choices of the 1976 Graduates of U.S. Medical Schools*, Washington, D.C.: Association of American Medical Colleges, 1977.

[3]Travis L. Gordon and D. S. Johnson, "Study of U.S. Medical School Applicants, 1976-1977," *Journal of Medical Education*, Vol. 53, No. 11, November 1978, pp. 873-897.

others reported that they had never heard of the AFHPSP scholarship program, but would have applied had they known. The frequency with which such comments appeared in the surveys and the number of uncompleted answers to questions regarding military practice led us to believe that there was a substantial information gap among students about the AFHPSP and military medical practice. Given the absence of the draft, this was not surprising. However, we felt that the Department of Defense should attempt to eliminate this gap and to increase their recruiting efforts. Medical students need to know, at the very least, that the AFHPSP is available and should receive adequate and timely information regarding the scholarship provisions and the military practice conditions. Students should have access to recruiters, and recruiting efforts should begin early enough for students to become familiarized with the AFHPSP as an alternative for financing their medical school education.

VI. CONCLUSIONS

The principal source of physician procurement for the Department of Defense since the end of the draft has been the Armed Forces Health Professions Scholarship Program. As a result of legislation authorizing National Health Service Corps scholarships administered by HEW, the competitive position of the AFHPSP scholarship has been eroded. The empirical results derived from the survey of first and second year medical students which are presented in this report suggested that the Department of Defense would fall short of its requirements for medical AFHPSP accessions by about 400 per year after 1978 if there were full NHSC funding for all its qualified applicants.

The analysis suggested that increasing service compensation by about $7,500 (1978 dollars) per year would eliminate the shortfall and would probably be more cost effective than offering a stipend beyond that offered by NHSC. Another benefit of such action might be an increase in career retention. Although increasing the residency opportunity would also increase AFHPSP participation, serious thought should be given to such a policy's impact on short-run physician shortfalls and specialty mix. In addition, although we find the effects of taxation on participation to be not large, it is nevertheless significant that taxation brings about a reduction in the share of private school medical students. Finally, we recommended that AFHPSP stipend provisions remain competitive with, but not exceed, the NHSC stipend provisions. Our results showed that participation is relatively insensitive to increases in the stipend, but that AFHPSP must be inflation-protected or the gap between the stipends of the two programs will widen.

Our recommendation to increase compensation was incorporated into the 1980 Physicians Pay Bill (P.L. 96-284). The qualitative information also suggested that increasing opportunities for graduate medical education could have a significant effect on participation. Although officially the residency policy was not changed, the services generally allow residency training which is consistent with their increased demand for specialists. This has resulted in a much larger proportion of AFHPSP participants completing residency training before entering active duty. Lastly, the survey has shown that many of the respondents knew very little about medical opportunities in the military, and we recommended that some administrative attention be given to this. These additional recommendations were implemented and AFHPSP is a viable program today.

Appendix A

THE MEDICAL STUDENT SURVEY

This appendix describes the Medical Student Survey instrument used to gather the basic data for the research reported in this paper. A description of the sample is given, followed by a description of the survey content.

THE SAMPLE

The sample of medical students to whom this survey was addressed was given to Rand by the American Medical Association. It consisted of 3,397 randomly selected medical students enrolled in U.S. medical schools.

Three groups of students were included:

1. First year students enrolled in four-year programs; expected to graduate in 1980.
2. First year students enrolled in three-year programs; expected to graduate in 1979.
3. Second year students enrolled in four-year programs; expected to graduate in 1979.

Table A.1 shows the response rate for the survey. Of the 3,397 surveys mailed, 1,916 were returned by students and an additional 410 surveys were returned to the post office as undeliverable. The overall response rate (excluding undeliverables) was 64 percent.

Table A.1

SURVEY RESPONSE RATE

Category	Number of Surveys Returned
First year students/4-year program	1,000
Second year students/4-year program	753
First year students/3-year program	70
Fourth year students/4-year program	1
Third year students/4-year program	40
Second year students/3-year program	11
Unknown	41
(64% response rate)	1,916

THE SURVEY CONTENT

The medical student survey consisted of a 44-item questionnaire designed to gather information on:

1. The student's socio-demographic characteristics.
2. The student's preferences for his/her future career environment (location, type of practice, leisure, etc.).
3. The student's perception and relative ranking of practice conditions in the military, the National Health Service Corps, and private practice.
4. The student's current and prospective educational and living expenses and sources of funds to meet these expenses.
5. The student's evaluation of the AFHPSP, NHSC Scholarship and federal loan programs as alternative methods of financing their medical school education.

The full 44 survey questions make up Appendix B. Questions 1 through 8 and questions 17 through 44 provide information on categories one through four. Questions 9 through 16 formed the core section of the survey, and are discussed below.

In questions 9 and 13 students were given a description of the three federal programs (AFHPSP, NHSC, federal loan) now offered to medical students to finance their medical school education. Each student was then asked to rank these three alternative methods of financing medical school education and his own current financing scheme on a scale from 1 to 100. In question 9 students were asked restrospectively how they would have rated these programs if they had been available for their current academic year (AY 76/77). Question 13 asked students to rate the programs prospectively as a medical school financing alternative for the coming year (AY 77/78).

Several changes in the benefits of the three federal programs (AFHPSP, NHSC, and loan) were introduced. Students were asked to compare the modified program benefits with the benefit structure now mandated by federal law. Each student was asked to rate four modified versions of the NHSC (questions 10 and 14) and the AFHPSP (questions 11 and 15) and two of the loan program (questions 12 and 16). Changes in program benefits were both pecuniary and non-pecuniary in nature. In questions 10 through 12 students were asked for retrospective ratings and in questions 14 through 16 for prospective ratings of the modified programs.

The following hypothetical changes in benefits for the three programs were made:

A. The AFHPSP

1. Changes in the monthly stipend (currently $400).
   a. Increase the stipend to $600 per month.
   b. Increase the stipend to $800 per month.
   c. Remove the annual cost of living increase.
2. Changes in the service compensation (currently $20,000 per year).
   a. Increase the service compensation to $29,000 per year.
   b. Increase the service compensation to $37,000 per year.
3. Changes in the residency policy (currently 50 percent of program participants may complete specialty training before beginning their service obligation).
   a. Increase the residency opportunity to 100 percent.
   b. Residency training may be completed in civilian programs.
4. Changes in obligated service provisions.
   a. Guarantee participants the opportunity to serve in their specialty.
   b. Guarantee participants will remain in one location for the first four years of obligated service.
   c. Assignment to active duty through a matching program.
   d. Joint assignment with spouse if both are serving on active military duty.

B. The NHSC Scholarship

1. Changes in the monthly stipend (currently $400).
   a. Increase the stipend to $600 per month.
   b. Increase the stipend to $800 per month.
   c. Remove annual cost of living increase.
2. Changes in the service compensation (currently $20,000 per year).
   a. Increase the service compensation to $29,000 per year.
   b. Increase the service compensation to $37,000 per year.

3. Changes in residency policy (currently three year limit on postgraduate training).
   a. Remove three year limit on postgraduate training.

4. Changes in obligated service provisions.
   a. Participant may serve as a private physician in a shortage area for the entire length of the obligated service period.
   b. Joint assignment with spouse when both are completing an NHSC obligated service requirement.
   c. Participant to assume that 75 percent of obligated service positions are in isolated rural areas with little professional peer contact and 25 percent in densely populated low income urban areas.
   d. Participant to assume that 25 percent of obligated service positions are in isolated rural areas with little professional peer contact and 75 percent in densely populated low income urban areas.
   e. Participant has no choice in service obligation site.

C. The loan program.

1. Changes in interest payment provisions.
   a. Interest payments to be deferred until graduation from medical school.
   b. Interest payments to be deferred until three years after graduation from medical school.

These changes in benefits and conditions were substituted for one or more of the currently prevailing benefits or added to the existing scholarship provisions.

Because of the large number of possible options and benefit structures, each student was asked to rate only four alternatives. To rate all benefit combinations which resulted from changes in the programs, twelve versions of the survey were developed. Versions 1 through 12 of the survey differed only in questions 10, 11, 14, and 15, which asked students to rate the modified benefit structures of the NHSC and AFHPSP programs. A complete list of the alternative options to be rated by the respondents for each of the three programs (NHSC, AFHPSP, LOAN) appears as Appendix C. This list also indicates in which of the survey versions the specific option appears.

The next step in the preparation of the questionnaire was the random assignment of the above AFHPSP and NHSC options to 12 groups of four questions each. These 12 groups formed the basis for the 12 versions of the survey. The two loan options were identical for each of the 12 versions.

Questions 13 through 16 of the 12 versions of the survey questionnaire are in Appendix D.

DISTRIBUTION OF THE SURVEY

Following a pretest of the survey at UCLA Medical School, the survey was mailed to 3,397 medical students.

Each of the 12 versions was distributed to one-twelfth (1/12) of the 2,618 male students (77 percent) in the sample. The 782 female students (23 percent) were divided into two equal groups. One group was given version 4 of the questionnaire, the other group version 5. Each of these versions included the joint assignment option, which reflected concerns voiced by many students during the pretest. These students felt that unless there was a provision for joint assignment, the possibility of being separated from their spouses during the obligated service period would prevent them from accepting a scholarship.

The first mailing of the 3,397 surveys took place on August 12, 1977. On September 19, a followup survey was mailed to 2,411 students. This was followed by a Mailgram (October 13) stressing the importance of returning the survey and a third mailing of a survey packet to 1,865 students on October 14. A final letter asking students to return a previously mailed survey was sent on November 7, 1977, to 1,391 students.

As of January 18, 1978, a total of 1,916 students had completed and returned the survey to Rand.

The individual surveys were then coded and keypunched and a codebook was prepared. The codebook reproduces each question in the survey instrument, lists the question's authorized response code, and gives the item name used to identify the corresponding response field in the machine readable file. Finally, it provides question-by-question response counts (i.e., marginals).

Appendix B

SAMPLE MEDICAL STUDENT SURVEY QUESTIONNAIRE

GENERAL INSTRUCTIONS

Please write your answers directly in this booklet in the spaces provided next to each question.

If the exact response you would like is not one of the available choices, please check the one response that is closest to your desired response. If you wish, feel free to make a comment in the margin or at the end of the survey.

The survey asks your assessment of a number of options for financing medical education and for subsequent medical practice. Inclusion of an option in this survey does not necessarily imply endorsement by the federal government.

Please return your completed survey booklet in the enclosed postpaid and preaddressed envelope.

At the time you return your completed survey, please return separately the enclosed postcard to indicate you have completed the survey. You are not requested to identify yourself on the survey.

Participation in this survey is voluntary and you may decline to answer any question if you do not wish to provide the information requested.

1-10/

CARD 01 11-12/

13-22/

CARD 01

State	No.	School or College
Ala	1	Alabama, Birmingham
	2	South Alabama, Mobile
Ariz	3	Arizona, Tucson
Ark	4	Arkansas, Little Rock
Calif	5	California, Davis
	6	California, Irvine
	7	Loma Linda, Loma Linda
	8	California, Los Angeles
	9	Southern Calif., Los Angeles
	10	Stanford, Palo Alto
	11	California, San Diego
	12	California, San Francisco
Colo	13	Colorado, Denver
Conn	14	Connecticut, Farmington
	15	Yale, New Haven
DC	16	Georgetown
	17	George Washington
	18	Howard
Fla	19	Florida, Gainesville
	20	Miami, Miami
	21	South Florida, Tampa
Ga	22	Emory, Atlanta
	23	Georgia, Augusta
Haw	24	Hawaii, Honolulu
Ill	25	Chicago Medical, Chicago
	26	Northwestern, Chicago
	27	Loyola-Stritch, Chicago
	28	Rush, Chicago
	29	Chicago-Pritzker, Chicago
	30	Illinois, Chicago
	31	Southern Illinois
	32	Chicago Osteopathic, Chicago
Ind	33	Indiana, Indianapolis
Iowa	34	Iowa, Iowa City
	35	Osteopathic Medicine, Des Moines
Kan	36	Kansas, Kansas City
Ky	37	Kentucky, Lexington
	38	Louisville, Louisville
La	39	Louisiana, New Orleans
	40	Tulane, New Orleans
	41	Louisiana, Shreveport
Md	42	Johns Hopkins, Baltimore
	43	Maryland, Baltimore
Mass	44	Boston, Boston
	45	Harvard, Boston
	46	Tufts, Boston
	47	Massachusetts, Worcester
Mich	48	Michigan, Ann Arbor
	49	Wayne State, Detroit
	50	Mich. State-Medical, E. Lansing
	51	Mich. State-Osteopathic, E. Lansing
Minn	52	Minnesota, Minneapolis
	53	Minnesota, Duluth
	54	Mayo, Rochester
Miss	55	Mississippi, Jackson
Mo	56	Missouri, Columbia
	57	Missouri, Kansas City
	58	Saint Louis, St. Louis
	59	Washington, St. Louis
	60	Kansas City Osteopathic, Kansas City
	61	Kirksville Osteopathic, Kirksville
Neb	62	Creighton, Omaha
	63	Nebraska, Omaha
Nev	64	Nevada, Reno
NH	65	Dartmouth, Hanover
NJ	66	CMDNJ-New Jersey, Newark
	67	CMDNJ-Rutgers, Piscataway
NM	68	New Mexico, Albuquerque
NY	69	Albany, Albany
	70	SUNY, Buffalo
	71	Columbia, NY
	72	Cornell, NY
	73	Albert Einstein, NY
	74	Mount Sinai, NY
	75	NY Medical College, NY
	76	NY University, NY
	77	SUNY, Brooklyn
	78	Rochester, Rochester
	79	SUNY, Syracuse
	80	SUNY, Stony Brook
NC	81	North Carolina, Chapel Hill
	82	Duke, Durham
	83	Bowman Gray, Winston-Salem
ND	84	North Dakota, Grand Forks
Ohio	85	Cincinnati, Cincinnati
	86	Case West, Res., Cleveland
	87	Ohio State, Columbus
	88	Medical College, Toledo
Okla	89	Oklahoma, Oklahoma City
	90	Oklahoma Osteopathic, Tulsa
Ore	91	Oregon, Portland
Pa	92	Pa. State Univ., Hershey
	93	Hahnemann, Phildelphia
	94	Jefferson, Philadelphia
	95	Med. Coll. of Pa., Philadelphia
	96	Temple, Philadelphia
	97	U. of Pa., Philadelphia
	98	Pittsburgh, Pittsburgh
	99	Philadelphia Osteopathic, Philadelphia
PR	100	Puerto Rico, San Juan
RI	101	Brown, Providence
SC	102	South Carolina, Charleston
SD	103	South Dakota, Vermillion
Tenn	104	Tennessee, Memphis
	105	Meharry, Nashville
	106	Vanderbilt, Nashville
Tex	107	Texas Southwestern, Dallas
	108	Texas, Galveston
	109	Baylor, Houston
	110	Texas, San Antonio
	111	Texas, Houston
	112	Texas Tech, Lubbock
	113	Texas Osteopathic, Ft. Worth
Utah	114	Utah, Salt Lake City
Vt	115	Vermont, Burlington
Va	116	Virginia, Charlottesville
	117	Medical College, Richmond
	118	Eastern Virginia
Wash	119	Washington, Seattle
WVA	120	West Virginia, Morgantown
Wis	121	Wisconsin, Madison
	122	Medical College, Milwaukee
	123	Other (SPECIFY above)

1. Which medical school do you attend?

   Number ☐☐☐ 23-25/ School or College _____

   Use the preceding list to determine the number which corresponds to your school or college.

2. If you attend a public medical school are you paying out of state tuition?

   1. Yes ☐ 26/
   2. No ☐
   3. Not applicable ☐

3. What was your medical student status for the 1976/77 school year?

   If Four-Year Medical Program

   1. First Year ☐ 27/
   2. Second Year ☐
   3. Third Year ☐
   4. Fourth Year ☐

   If Three-Year Medical Program

   5. First Year ☐
   6. Second Year ☐
   7. Third Year ☐

   If other Medical Program:

   Specify: _____

4. What were your Medical College Admission Test (MCAT) scores in Verbal Ability and Science?

Percentile		Raw Score	
☐☐	(OR)	☐☐☐	28-32/ Verbal ability score
☐☐	(OR)	☐☐☐	33-37/ Science score

CARD 01

In Questions 5 thru 16, "this year" refers to academic year 1976-1977 (September 1976 thru August 1977), and "next year" refers to academic year 1977-1978 (September 1977 thru August 1978).

5. Please estimate your total expenses for this academic year including the summer. Include expenses for which you are reimbursed.

CARD 02 11-12/

My estimated expenses for this year are:

1. Tuition	$	13-17/
2. Lab fees	$	18-22/
3. Books	$	23-27/
4. Other medical school fees or expenses	$	28-32/
5. Rent or lodging and utilities	$	33-37/
6. Food, beverages, etc.	$	38-42/
7. Medical, dental	$	43-47/
8. Transportation (including commuting expenses)	$	48-52/
9. All other regular expenses	$	53-57/

6. How are you financing your expenses for <u>this year</u>? Please estimate the amount from each source of income.

1. Own earnings and savings	$	58-62/
2. Spouse's earnings	$	63-67/
3. Gifts/loans from family	$	68-72/
CARD 03		11-12/
4. Armed Forces Health Professions Scholarship Program	$	13-17/
5. Public Health Service Scholarship	$	18-22/
6. Other federal scholarship	$	23-27/
7. Veterans benefits	$	28-32/
8. Grants from school funds	$	33-37/
9. Other grants or scholarships	$	38-42/
10. Federal Health Professions Loan	$	43-47/
11. Federally guaranteed loan (through school or private bank)	$	48-52/
12. Other guaranteed loan (through school or private bank)	$	53-57/
13. Private bank loan (not guaranteed)	$	58-62/
14. Other loans	$	63-67/
15. Other	$	68-72/

CARD 02/03

7. Please estimate your total expenses for next academic year including next summer. Include expenses for which you will be reimbursed.

CARD 04 11-12/

My estimated expenses for next year are:

1. Tuition	$	13-17/
2. Lab fees	$	18-22/
3. Books	$	23-27/
4. Other medical school fees or expenses	$	28-32/
5. Rent or lodging and utilities	$	33-37/
6. Food, beverages, etc.	$	38-42/
7. Medical, dental	$	43-47/
8. Transportation (including commuting expenses)	$	48-52/
9. All other regular expenses	$	53-57/

8. How are you planning to finance your expenses for next year? Please estimate the most likely amount from each source of income.

1. Own earnings and savings	$	58-62/
2. Spouse's earnings	$	63-67/
3. Gifts/loans from family	$	68-72/
CARD 05		11-12/
4. Armed Forces Health Professions Scholarship Program	$	13-17/
5. Public Health Service Scholarship	$	18-22/
6. Other federal scholarship	$	23-27/
7. Veterans Benefits	$	28-32/
8. Grants from school funds	$	33-37/
9. Other grants or scholarships	$	38-42/
10. Federal Health Professions Loan	$	43-47/
11. Federally guaranteed loan (through school or private bank)	$	48-52/
12. Other guaranteed loan (through school or private bank)	$	53-57/
13. Private bank loan (not guaranteed)	$	58-62/
14. Other loans	$	63-67/
15. Other	$	68-72/

CARD 04/05

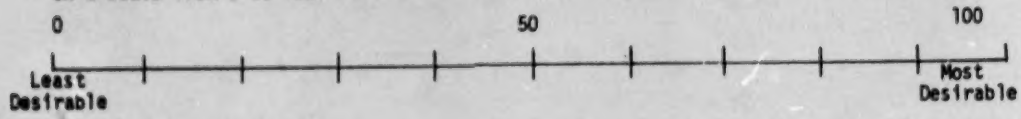
	PROGRAM BENEFITS	PROGRAM REQUIREMENTS
NHSC SCHOLARSHIP (National Health Service Corps Scholarship Program)	Tuition, fees and direct medical school expenses (books, etc.)* Monthly stipend - $400 per month for 12 months ($4,800 per year)* You may pursue post-graduate training (Internship/Residency) for up to 3 years prior to beginning service obligation. Internship/Residency training may be available for up to 10% of NHSC scholarship holders in PHS hospitals at an annual salary of approximately $20,000.	Requires 1 year of practice as an NHSC physician in a designated shortage area for each year of scholarship support. (Practice while taking intern or residency training does not count toward this obligation.) A shortage area may be: a) an area in an urban or rural location which the Secretary of HEW determines has a health manpower shortage. b) a population group which the Secretary determines has such a shortage, or c) a public federal or nonprofit private medical facility. Compensation will average approximately $22,000 per year while serving in a shortage area.
AFHPSP SCHOLARSHIP (Armed Forces Health Professions Scholarship Program)	Tuition, fees and direct medical expenses (books, etc.)* Monthly stipend - $400 per month for 10-1/2 months ($4,200 per year); and $1,400 for 45 days active duty summer service.* In many cases this duty may be served at your medical school upon request from the institution. Provides for completion of 1 year of internship for all participants at either military or civilian hospitals and for completion of specialty training for 50% of participants prior to beginning service obligation. Most residency positions will be in military hospitals. Intern/resident positions in military hospitals will pay approximately $20,000 per year.	Requires 1 year of practice as an active duty military physician for each year of scholarship support. (Active duty service while taking intern or residency training does not count towards this obligation.) Compensation will average approximately $22,000 per year while on active duty.
HEW FEDERALLY INSURED LOANS (Federally Insured Loans for Health Professions Students)	Loan insured by the Federal Government of up to $10,000 per year to cover tuition, fees and direct medical school expenses (books, etc.) Maximum total amount borrowed during medical school is $50,000. Eligible lenders could include schools, state agencies, and financial or credit institutions.	Repayment of principal may be deferred until 3 years after graduation from medical school and spread over a 15 year period. Interest (and fees) on loan not to exceed 12% per annum. Interest payments must be made during medical school. (At 12% interest this equals $1,200 per year for each $10,000 borrowed.) At the discretion of the Secretary of HEW the borrower may be partially or fully released from the principal and interest obligation if he or she agrees to serve in shortage area. (See NHSC Scholarship.)

*Assume all payments will be adjusted annually for cost of living increases, and that all stipend, tuition, fees and medical school expense benefits are taxable. Total federal income tax liability will depend on the level of your tuition and fees. The following table illustrates the approximate annual tax liability, including tax owed on the stipend, for two levels of tuition and fees ($1,000 and $5,000):

Tax Status	Annual Tuition and Fees $1,000	$5,000
Single	$ 575 tax	$1,450 tax
Married, no children, spouse not working	375 tax	1,050 tax
Married, no children, spouse earns $5,000 per year	1,225 tax	2,100 tax

CARD 06 11-12/ [1] 13-14

9. Consider the three programs for financing your medical school education described on the opposite page and the way you are financing your medical school education this year (76-77). Assume that you were eligible and that each of these alternatives had been available to you at the beginning of this academic year. How would you have rated them on a scale from 0 to 100?



RATING

A. NHSC Scholarship [ ][ ][ ] 15-17/

B. Armed Forces Scholarship (AFHPSP) [ ][ ][ ] 18-20/

C. New Federally Insured Loan [ ][ ][ ] 21-23/

D. Your present method of finance [ ][ ][ ] 24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100*)

10. How would you rate the NHSC Scholarship:

- If the 3 year limit on post graduate training were removed? [ ][ ][ ] 27-29/
- If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year? [ ][ ][ ] 30-32/
- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? [ ][ ][ ] 33-35/
- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? [ ][ ][ ] 36-38/

11. How would you rate the AFHPSP Scholarship:

- If there were no annual cost of living adjustment in the stipend? [ ][ ][ ] 39-41/
- If the residency opportunity were increased to 100% and the monthly stipend were increased to $600? [ ][ ][ ] 42-44/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year? [ ][ ][ ] 45-47/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? [ ][ ][ ] 48-50/

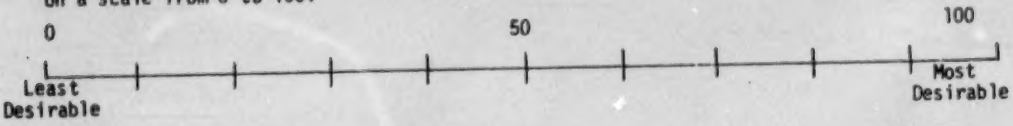
12. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? [ ][ ][ ] 51-53/
- If interest payments were deferred until 3 years after medical school? [ ][ ][ ] 54-56/

CARD 06

CARD 06 11-12/ [1] 13-14

9. Consider the three programs for financing your medical school education described on the opposite page and the way you are financing your medical school education this year (76-77). Assume that you were eligible and that each of these alternatives had been available to you at the beginning of this academic year. How would you have rated them on a scale from 0 to 100?



RATING

A. NHSC Scholarship [ ][ ][ ] 15-17/

B. Armed Forces Scholarship (AFHPSP) [ ][ ][ ] 18-20/

C. New Federally Insured Loan [ ][ ][ ] 21-23/

D. Your present method of finance [ ][ ][ ] 24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100*)

10. How would you rate the NHSC Scholarship:

- If the 3 year limit on post graduate training were removed? [ ][ ][ ] 27-29/
- If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year? [ ][ ][ ] 30-32/
- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? [ ][ ][ ] 33-35/
- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? [ ][ ][ ] 35-38/

11. How would you rate the AFHPSP Scholarship:

- If there were no annual cost of living adjustment in the stipend? [ ][ ][ ] 39-41/
- If the residency opportunity were increased to 100% and the monthly stipend were increased to $600? [ ][ ][ ] 42-44/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year? [ ][ ][ ] 45-47/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? [ ][ ][ ] 48-50/

12. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? [ ][ ][ ] 51-53/
- If interest payments were deferred until 3 years after medical school? [ ][ ][ ] 54-56/

CARD 06

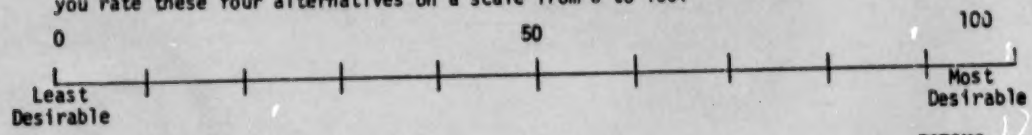
	PROGRAM BENEFITS	PROGRAM REQUIREMENTS
NHSC SCHOLARSHIP (National Health Service Corps Scholarship Program)	Tuition, fees and direct medical school expenses (books, etc.)* Monthly stipend - $400 per month for 12 months ($4,800 per year)* You may pursue post-graduate training (Internship/Residency) for up to 3 years prior to beginning service obligation. Internship/Residency training may be available for up to 10% of NHSC scholarship holders in PHS hospitals at an annual salary of approximately $20,000.	Requires 1 year of practice as an NHSC physician in a designated shortage area for each year of scholarship support. (Practice while taking intern or residency training does not count toward this obligation.) A shortage area may be: a) an area in an urban or rural location which the Secretary of HEW determines has a health manpower shortage. b) a population group which the Secretary determines has such a shortage, or c) a public federal or nonprofit private medical facility. Compensation will average approximately $22,000 per year while serving in a shortage area.
AFHPSP SCHOLARSHIP (Armed Forces Health Professions Scholarship Program)	Tuition, fees and direct medical expenses (books, etc.)* Monthly stipend - $400 per month for 10-1/2 months ($4,200 per year); and $1,400 for 45 days active duty summer service.* In many cases this duty may be served at your medical school upon request from the institution. Provides for completion of 1 year of internship for all participants at either military or civilian hospitals and for completion of specialty training for 50% of participants prior to beginning service obligation. Most residency positions will be in military hospitals. Intern/resident positions in military hospitals will pay approximately $20,000 per year.	Requires 1 year of practice as an active duty military physician for each year of scholarship support. (Active duty service while taking intern or residency training does not count towards this obligation.) Compensation will average approximately $22,000 per year while on active duty.
NEW FEDERALLY INSURED LOANS (Federally Insured Loans for Health Professions Students)	Loan insured by the Federal Government of up to $10,000 per year to cover tuition, fees and direct medical school expenses (books, etc.) Maximum total amount borrowed during medical school is $50,000. Eligible lenders could include schools, state agencies, and financial or credit institutions.	Repayment of principal may be deferred until 3 years after graduation from medical school and spread over a 15 year period. Interest (and fees) on loan not to exceed 12% per annum. Interest payments must be made during medical school. (At 12% interest this equals $1,200 per year for each $10,000 borrowed.) At the discretion of the Secretary of HEW the borrower may be partially or fully released from the principal and interest obligation if he or she agrees to serve in shortage area. (See NHSC Scholarship.)

*Assume all payments will be adjusted annually for cost of living increases, and that all stipend, tuition, fees and medical school expense benefits are taxable. Total federal income tax liability will depend on the level of your tuition and fees. The following table illustrates the approximate annual tax liability, including tax owed on the stipend, for two levels of tuition and fees ($1,000 and $5,000):

Tax Status	Annual Tuition and Fees $1,000	$5,000
Single	$ 575 tax	$1,450 tax
Married, no children, spouse not working	375 tax	1,050 tax
Married, no children, spouse earns $5,000 per year	1,225 tax	2,100 tax

CARD 07 11-12/ ☐☐ 13-14/

13. Now assume that each of the three alternatives for financing your medical education described again on the opposite page and your projected method of finance will be available to you for financing next year's medical school expenses (77-78). How would you rate these four alternatives on a scale from 0 to 100?



RATING

A. NHSC Scholarship ☐☐☐ 15-17/

B. Armed Forces Scholarship (AFHPSP) ☐☐☐ 18-20/

C. New Federally Insured Loan ☐☐☐ 21-23/

D. Your present method of finance ☐☐☐ 24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100*)

14. How would you rate the NHSC Scholarship:

- If the 3 year limit on post graduate training were removed? ☐☐☐ 27-29/
- If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year? ☐☐☐ 30-32/
- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? ☐☐☐ 33-35/
- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? ☐☐☐ 36-38/

15. How would you rate the AFHPSP Scholarship:

- If there were no annual cost of living adjustment in the stipend? ☐☐☐ 39-41/
- If the residency opportunity were increased to 100% and the monthly stipend were increased to $600? ☐☐☐ 42-44/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year? ☐☐☐ 45-47/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? ☐☐☐ 48-50/

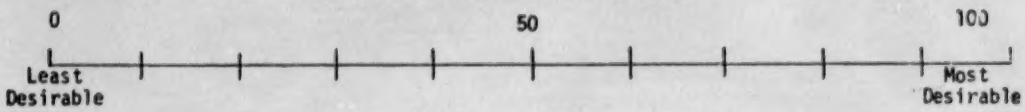
16. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? ☐☐☐ 51-53/
- If interest payments were deferred until 3 years after medical school? ☐☐☐ 54-56/

CARD 07

CARD 07 11-12/ ☐☐ 13-14/

13. Now assume that each of the three alternatives for financing your medical education described again on the opposite page and your projected method of finance will be available to you for financing next year's medical school expenses (77-78). How would you rate these four alternatives on a scale from 0 to 100?



	RATING	
A. NHSC Scholarship	☐☐☐	15-17/
B. Armed Forces Scholarship (AFHPSP)	☐☐☐	18-20/
C. New Federally Insured Loan	☐☐☐	21-23/
D. Your present method of finance	☐☐☐	24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100*)

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- If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year? ☐☐☐ 30-32/
- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? ☐☐☐ 33-35/
- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? ☐☐☐ 36-38/

15. How would you rate the AFHPSP Scholarship:

- If there were no annual cost of living adjustment in the stipend? ☐☐☐ 39-41/
- If the residency opportunity were increased to 100% and the monthly stipend were increased to $600? ☐☐☐ 42-44/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year? ☐☐☐ 45-47/
- If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year? ☐☐☐ 48-50/

16. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? ☐☐☐ 51-53/
- If interest payments were deferred until 3 years after medical school? ☐☐☐ 54-56/

CARD 07

CARD 08 11-12/

17. Compared to a group private practice, how would you rate the following conditions of medical practice for a National Health Service Corps (NHSC) physician in a federally designated health manpower shortage area?

	NHSC Better	Little or No Difference	Private Better	Not Sure	
	1	2	3	4	
a. Hours	☐	☐	☐	☐	13/
b. Support personnel	☐	☐	☐	☐	14/
c. Range of cases	☐	☐	☐	☐	15/
d. Paper work	☐	☐	☐	☐	16/
e. Salary and benefits	☐	☐	☐	☐	17/
f. Family life	☐	☐	☐	☐	18/
g. Professional development	☐	☐	☐	☐	19/
h. Consultation support	☐	☐	☐	☐	20/
i. Facilities	☐	☐	☐	☐	21/
j. Status and privileges	☐	☐	☐	☐	22/
k. Overall rating	☐	☐	☐	☐	23/

18. How would you rate the following conditions of medical practice in the military as compared with group private practice?

	Military Better	Little or No Difference	Private Better	Not Sure	
	1	2	3	4	
a. Hours	☐	☐	☐	☐	24/
b. Support personnel	☐	☐	☐	☐	25/
c. Range of cases	☐	☐	☐	☐	26/
d. Paper work	☐	☐	☐	☐	27/
e. Salary and benefits	☐	☐	☐	☐	28/
f. Family life	☐	☐	☐	☐	29/
g. Professional development	☐	☐	☐	☐	30/
h. Consultation support	☐	☐	☐	☐	31/
i. Facilities	☐	☐	☐	☐	32/
j. Status and privileges	☐	☐	☐	☐	33/
k. Overall rating	☐	☐	☐	☐	34/

CARD 08

19. How would you rate the following conditions of medical practice in the military as compared with practice in a shortage area as an NHSC physician?

	NHSC Better	Little or No Difference	Military Better	Not Sure	
	1	2	3	4	
a. Hours	☐	☐	☐	☐	35/
b. Support personnel	☐	☐	☐	☐	36/
c. Range of cases	☐	☐	☐	☐	37/
d. Paper work	☐	☐	☐	☐	38/
e. Salary and benefits	☐	☐	☐	☐	39/
f. Family life	☐	☐	☐	☐	40/
g. Professional development	☐	☐	☐	☐	41/
h. Consultation support	☐	☐	☐	☐	42/
i. Facilites	☐	☐	☐	☐	43/
j. Status and privileges	☐	☐	☐	☐	44/
k. Overall rating	☐	☐	☐	☐	45/

CARD 08

20. Shown below is a list of 25 items which represent different goals and aspects of a career in medicine. Please rate the <u>desirability</u> of these items to you by using the following scale:

Extremely Undesirable	Moderately Undesirable	Indifferent	Moderately Desirable	Extremely Desirable
1	2	3	4	5

Please try to spread your answers along the scale to show the relative desirability you place on each item. Please consider the influence your family (if applicable) may have on the decisions you will make concerning your career in medicine.

Enter your rating for each item in the box following the item.

A.	Practice in or very near a large city (over 100,000 population)	☐ 46/
B.	Practice in or very near a suburban setting or a small city (25,000 - 100,000 population)	☐ 47/
C.	Practice in a town (500 - 25,000 population)	☐ 48/
D.	Practice in a rural area, small town or village (under 500 population)	☐ 49/
E.	Practice in the military	☐ 50/
F.	Private practice, solo or group	☐ 51/
G.	Prepaid group practice	☐ 52/
H.	Practice for a large organization	☐ 53/
I.	Opportunity to engage in research	☐ 54/
J.	Opportunity to teach	☐ 55/
K.	Opportunity to work in medical administration or management	☐ 56/
L.	Opportunity to provide outpatient care/consultations	☐ 57/
M.	Opportunity to provide inpatient care/consultations	☐ 58/
N.	Opportunity to see a well-rounded patient-mix (both sexes, varying ages, degrees of illness)	☐ 59/
O.	Opportunity to see same patients on subsequent or follow-up visits	☐ 60/
P.	Opportunity for graduate specialty training of your choice (residencies, fellowships)	☐ 61/
Q.	Opportunity to attend professional conferences or meetings	☐ 62/
R.	Opportunity to travel, live and practice in different locations	☐ 63/
S.	Practice in one location for at least 5 years	☐ 64/
T.	Practice in one location permanently	☐ 65/
U.	Opportunity to set own hours and/or days of work	☐ 66/
V.	Opportunity for independent grooming and dress	☐ 67/
W.	Ample leave or vacation time each year	☐ 68/
X.	Opportunity to make sacrifices for others	☐ 69/
Y.	A guaranteed minimum income	☐ 70/

CARD 08

CARD 09 11-12/

21. Which one of the following areas are you considering most seriously at the present time?

1.	General Practice or Family Practice	☐ 13/
2.	Medical Specialties	☐
3.	Surgical Specialties	☐
4.	Other Specialties	☐
5.	Undecided	☐

If you checked "1," "2," "3," or "4" above and are seriously considering a specific specialty, please indicate below which specialty. PLEASE DO NOT CHECK MORE THAN ONE.

6.	Undecided on specific specialty	☐ 14-15/	
7.	General Practice	☐	
8.	Family Practice	☐	
9.	Allergy	☐	MEDICAL SPECIALTIES
10.	Cardiology	☐	
11.	Dermatology	☐	
12.	Gastroenterology	☐	
13.	Internal Medicine	☐	
14.	Pediatrics and Subspecialties	☐	
15.	Pulmonary Disease	☐	
16.	General Surgery	☐	SURGICAL SPECIALTIES
17.	Neurosurgery	☐	
18.	Obstetrics and Gynecology	☐	
19.	Ophthalmology	☐	
20.	Orthopedic Surgery	☐	
21.	Otolaryngology	☐	
22.	Plastic Surgery	☐	
23.	Colon and Rectal Surgery	☐	
24.	Thoracic Surgery	☐	
25.	Urology	☐	

(Continued on next page)

CARD 09

26. Aerospace Medicine ☐
27. Nuclear Medicine ☐
28. Submarine Medicine ☐
29. Anesthesiology ☐
30. Psychiatry and Subspecialties ☐
31. Radiology ☐
32. Pathology ☐
33. Neurology ☐
34. Occupational Medicine ☐
35. Physical Medicine ☐
36. Preventive Medicine ☐
37. Other (Specify) _____ ☐

} OTHER SPECIALTIES

22. Do you hold a Ph.D or equivalent degree?

No ☐ *16/*

Yes ☐

Year received ☐☐☐☐ *17-20/*
Major Field _____ ☐☐ *21-22/*
School _____ ☐☐☐ *23-25/*
State and Zip Code _____ ☐☐☐☐☐ *26-30/*

23. Do you hold an MA, MS or equivalent degree?

No ☐ *31/*

Yes ☐

Year received ☐☐☐☐ *32-35/*
Major Field _____ ☐☐ *36-37/*
School _____ ☐☐☐ *38-40/*
State and Zip Code _____ ☐☐☐☐☐ *41-45/*

24. Do you hold a bachelor's or equivalent degree?

No ☐ *46/*

Yes ☐

Year received ☐☐☐☐ *47-50/*
Major Field _____ ☐☐ *51-52/*
School _____ ☐☐☐ *53-55/*
State and Zip Code _____ ☐☐☐☐☐ *56-60/*

CARD 09

CARD 10 11-12/

25. How old were you on your last birthday?

Years ☐☐ 13-14/

26. What is your sex?

1. Male ☐ 15/
2. Female ☐

27. What do you consider yourself?

1. White (other than Spanish or Mexican Surname) ☐ 16/
2. Black ☐
3. Oriental ☐
4. American Indian ☐
5. Spanish or Mexican Surname ☐
6. Other (Specify: _____) ☐

28. What is your marital status?

1. Single ☐ 17/
2. Divorced/Separated ☐
3. Widowed ☐
4. Married ☐

IF MARRIED, does your spouse attend school?

1. Undergraduate ☐ 18/
2. Graduate ☐
3. Professional ☐
4. Other ☐
5. Does not attend school ☐

Does your spouse work?

1. No ☐ 19/
2. Yes ☐

IF YES, How many hours did he/she work last week?

Hours ☐☐ 20-21/

How many weeks did he/she work last year?

Weeks ☐☐ 22-23/

What were his/her earnings last year? (Answer only one)

Per Hour $ ☐☐.☐☐ 24-27/

Per Week $ ☐☐☐ 28-30/

Per Month $ ☐☐☐☐ 31-34/

Per Year $ ☐☐☐☐☐ 35-39/

CARD 10

29. How many children do you have?

Children (write "0" if none) ☐ 40/

30. How many persons - excluding yourself, your spouse, and your children (if any) - are financially dependent on you?

1. None ☐ 41/
2. One ☐
3. Two ☐
4. Three ☐
5. Four or more ☐

31. What was the setting where you spent most of your childhood?

1. Rural, small town, or village (under 500 population) ☐ 42/
2. Town (500 - 25,000 population) ☐
3. Suburb or small city (25,000 - 100,000 population) ☐
4. Large city (over 100,000 population) ☐
5. Other (Specify: _____) ☐

32. Do you have any brothers and/or sisters who now attend college? How many?

(Write "0" if none) ☐ 43/

33. What is your parents' combined annual income before taxes?

1. Less than $10,000 ☐ 44/
2. $10,000 - $14,999 ☐
3. $15,000 - $19,999 ☐
4. $20,000 - $29,999 ☐
5. $30,000 or more ☐
6. Not applicable ☐

CARD 10

34. What is the occupation of your father?

1. Physician ☐ 45-46/
2. Other professional ☐
3. Owner, manager, proprietor (including farm) ☐
4. Salesperson ☐
5. Clerical worker ☐
6. Crafts, skilled worker ☐
7. Unskilled ☐
8. Military ☐
9. Other (Specify: _____) ☐
10. Father deceased ☐

35. What is the occupation of your mother?

1. Physician ☐ 47-48/
2. Other professional ☐
3. Owner, manager, proprietor (including farm) ☐
4. Salesperson ☐
5. Clerical worker ☐
6. Crafts, skilled worker ☐
7. Unskilled ☐
8. Military ☐
9. Homemaker ☐
10. Other (Specify: _____) ☐
11. Mother Deceased ☐

CARD 10

36. Have you ever been contacted regarding a Public Health Service or NHSC Scholarship?

1. No ☐ 49/
2. Yes ☐

1. by HEW ☐ 50/
2. by the medical school ☐ 51/
3. by some other institution/ person (Specify) _____ ☐ 52/

37. Have you ever applied for a Public Health Service or NHSC Scholarship?

1. No ☐ 53/
2. Yes ☐

Were you ever offered a Public Health Service or NHSC Scholarship?

1. No ☐ 54/
2. Yes, and I accepted the Scholarship ☐
3. Yes, but I declined the Scholarship ☐

If you have declined a Public Health Service or NHSC Scholarship, what was the principal reason:

1. Received a better Scholarship (which one? _____) ☐ 55/
2. Made a better loan arrangement ☐
3. Could not change other arrangements ☐
4. Stipend too low ☐
5. Obligated service too long ☐
6. Did not like the type of obligated service assignment ☐
7. Residency training restrictions ☐
8. Other (Specify: _____) ☐

CARD 10

38. Have you ever been contacted regarding an AFHPSP Scholarship?

1. No ☐ 56/
2. Yes ☐

1. By the Army	☐	57/
2. By the Air Force	☐	58/
3. By the Navy	☐	59/
4. By the Medical School	☐	60/
5. By some other institution of person (Specify) _____	☐	61/

39. Have you ever applied for an AFHPSP Scholarship?

1. No ☐ 62/
2. Yes ☐

40. Were you ever offered an AFHPSP Scholarship?

1. No ☐ 63/
2. Yes ☐

41. Which service offered you the AFHPSP Scholarship?

1. Army ☐ 64/
2. Navy ☐
3. Air Force ☐

42. Did you accept the Scholarship?

1. Yes ☐ 65/
2. No ☐

43. If you did not accept the Scholarship, what was your principal reason for declining?

1. Received a better Scholarship (which one?) _____	☐	66/
2. Made a better loan arrangement	☐	
3. Could not change other arrangements	☐	
4. Stipend too low	☐	
5. Length of obligated service too long	☐	
6. Did not like the type of obligated service assignment	☐	
7. Residency training restrictions	☐	
8. Other (Specify) _____	☐	

CARD 10

44. Please add any comments that you would like to make (including desirable changes in federal programs for financing medical education, desirable changes in military or NHSC practice conditions, etc.):

Appendix C

HYPOTHETICAL OPTIONS FOR THE AFHPSP AND NHSC SCHOLARSHIP AND THE FEDERALLY INSURED LOAN PROGRAM

Medical Student Survey AFHPSP Options (Questions: 10,11,14,15. Versions 1-12)

How would you rate the AFHPSP Scholarship:

Appears in version no.: 1 2 3 4 5 6 7 8 9 10 11 12

1. If the monthly stipend were increased to $600?
2. If the service compensation were increased to $37,000/year?
3. If the stipend were increased to $600 and the service compensation were increased to $29,000/year?
4. If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year?
5. If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year?
6. If the monthly stipend were increased to $800 and the service compensation were increased to $37,000/year?
7. If the residency opportunity were increased to 100% and the monthly stipend were increased to $600?
8. If the residency opportunity were 100% and the monthly stipend were increased to $800?
9. If the residency opportunity were 100% and the service compensation were increased to $29,000/year?
10. If the residency opportunity were 100% and the service compensation were $37,000/year?
11. If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year?
12. If the residency opportunity were 100%, the monthly stipend were increased to $800, and the service compensation were increased to $27,000/year?*
*This option is due to a typographical error ($27,000 rather than $29,000).
13. If the residency opportunity were 100%, the monthly stipend were increased to $800, and the service compensation were increased to $29,000/year?

14. If the residency opportunity were increased to 100%, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year?

15. If the residency opportunity were 100%, the monthly stipend were increased to $800, and the service compensation were increased to $37,000/year?

16. If there were no annual cost of living adjustment in the stipend?

17. If the residency opportunity were 100%, the service compensation were increased to $37,000/year, and you were guaranteed the opportunity to practice in your specialty during your obligated service period?

18. If the monthly stipend were increased to $600 and your assignment to active duty in a geographic area were made through a matching program like that now used for internship and residency positions (the NIRMP)?

19. If the monthly stipend were increased to $800, the service compensation were increased to $29,000/year, and you were guaranteed the opportunity to serve in your specialty?

20. If the residency opportunity were 100%, the service compensation were increased to $37,000/year, and your assignment to active duty in a geographic area were made through a matching program like that now used for internship and residency positions (the NIRMP)?

21. If the monthly stipend were increased to $800 and if the military guaranteed assignments to the same locality when both husband and wife are serving on active military duty?

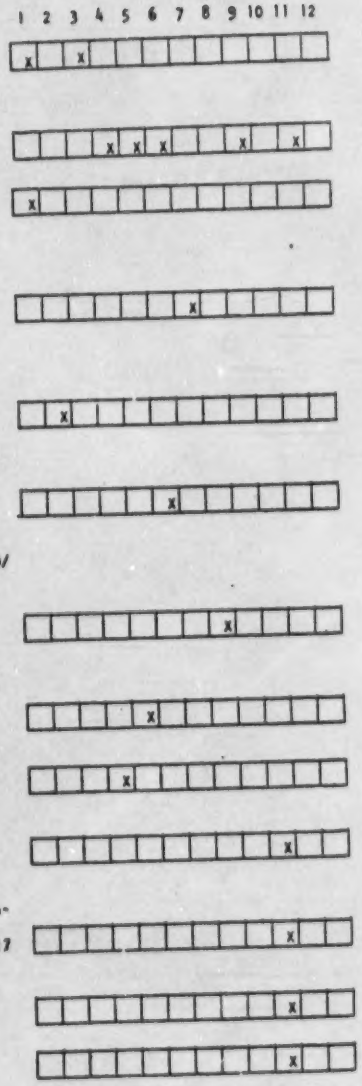
22. If the military guaranteed assignments in the same locality when both husband and wife are serving on active military duty?

23. If those permited to complete residency training were guaranteed the option of doing so in civilian programs?

24. If, for your obligated service, you were assigned to a geographic area through a matching program similar to the one now used for internship and residency programs (the NIRMP)?

25. If you were given a guarantee that you would not be moved during your first four years of obligated duty?

26. If you were guaranteed the opportunity to serve in your specialty?



Medical Student Survey NHSC Options (Questions: 10,11,14,15. Versions 1-12)

How would you rate the NHSC Scholarship:

		Appears in version no.: 1 2 3 4 5 6 7 8 9 10 11 12
1.	If the monthly stipend were increased to $600?	X
2.	If the monthly stipend were increased to $800?	X
3.	If the monthly stipend were increased to $600 and the service compensation were increased to $29,000/year?	X X
4.	If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year?	X X X
5.	If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year?	X X X X
6.	If the monthly stipend were increased to $800 and the service compensation were increased to $37,000/year?	X X X
7.	If the 3 year limit on post graduate training were removed?	X X
8.	If the 3 year limit on post graduate training were removed and the monthly stipend were increased to $600?	X
9.	If the 3 year limit on post graduate training were removed and the monthly stipend were increased to $800?	X X X
10.	If the 3 year limit on post graduate training were removed and the service compensation were increased to $29,000/year?	X X
11.	If the 3 year limit on post graduate training were removed and the service compensation were increased to $37,000/year?	X X X
12.	If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $29,000/year?	X X
13.	If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $800, and the service compensation were increased to $29,000/year?	X X X X

		1	2	3	4	5	6	7	8	9	10	11	12
14.	If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $600, and the service compensation were increased to $37,000/year?	X			X					X			X
15.	If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $800, and the service compensation were increased to $37,000/year?			X		X			X				X
16.	If the monthly stipend were increased to $600 and you could serve your obligated period as a <u>private</u> physician in a shortage area?		X										
17.	If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $800, and you could serve your obligated period as a <u>private</u> physician in a shortage area?						X						
18.	If the National Health Service Corps guaranteed assignments to the same locality when both husband and wife are completing an NHSC obligated service requirement?					X							
19.	If you could serve your total obligated period as a <u>private</u> physician in a shortage area?										X		
20.	If <u>75</u> percent of the obligated service positions were isolated, rural areas with little professional peer contact, and 25 percent were in densely populated, low-income urban areas?										X		
21.	If <u>25</u> percent of the obligated service positions were in isolated, rural areas with little professional peer contact, and 75 percent were in densely populated, low-income urban areas?										X		
22.	If you had no choice in service obligation site?										X		

LOAN OPTIONS

(Versions 1-12)

How would you rate the New Federally Insured Loan:

1. If the interest payments were deferred until graduation from medical school?

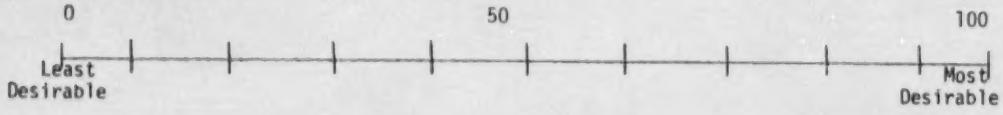
2. If interest payments were deferred until 3 years after medical school?

Appendix D

VERSIONS 1 THROUGH 12 OF QUESTIONS 9 THROUGH 16

CARD 06 11-12/ 6 13-14/

9. Consider the three programs for financing your medical school education described on the opposite pate and the way you are financing your medical school education this year (76-77). Assume that you were eligible and that each of these alternatives had been available to you at the beginning of this academic year. How would you have rated them on a scale from 0 to 100?



RATING

A. NHSC Scholarship ☐☐☐ 15-17/

B. Armed Forces Scholarship (AFHPSP) ☐☐☐ 18-20/

C. New Federally Insured Loan ☐☐☐ 21-23/

D. Your present method of finance ☐☐☐ 24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100*)

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- If the monthly stipend were increased to $600? ☐☐☐ 27-29/
- If the monthly stipend were increased to $800 and the service compensation were increased to $37,000/year? ☐☐☐ 30-32/
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- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $800, and the service compensation were increased to $29,000/year? ☐☐☐ 36-38/

11. How would you rate the AFHPSP Scholarship:

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- If the residency opportunity were 100%, the monthly stipend were increased to $800, and the service compensation were increased to $37,000/year? ☐☐☐ 48-50/

12. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? ☐☐☐ 51-53/
- If interest payments were deferred until 3 years after medical school? ☐☐☐ 54-56/

CARD 06

CARD 07 11-12/ 6 13-14/

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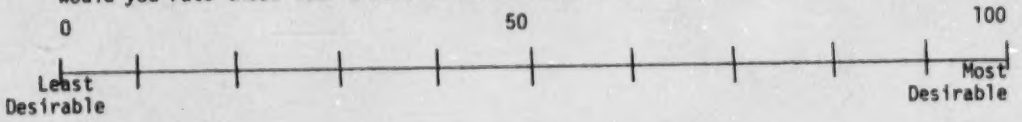

RATING

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CARD 07

CARD 06 11-12/ [5] 13-14/

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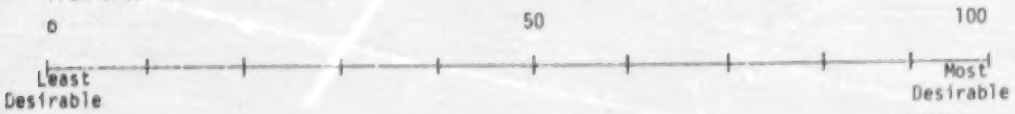

RATING

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CARD 06

CARD 07 11-12/ [5] 13-14/

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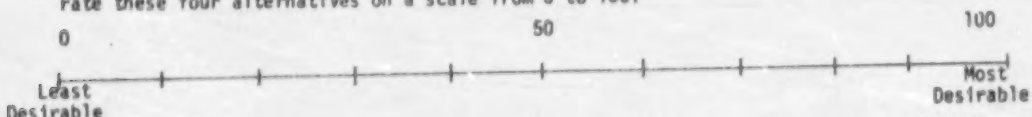

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CARD 07

CARD 06 11-12/ 4 13-14/

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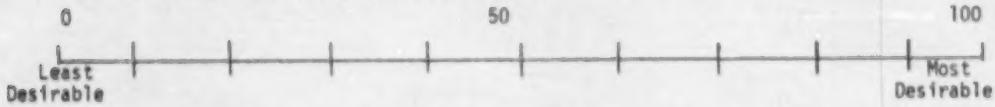

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CARD 06

CARD 07 11-12/ [4] 13-14/

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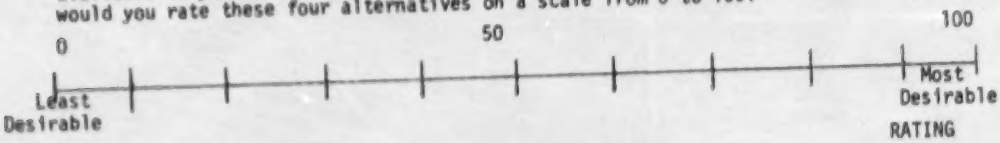

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CARD 07

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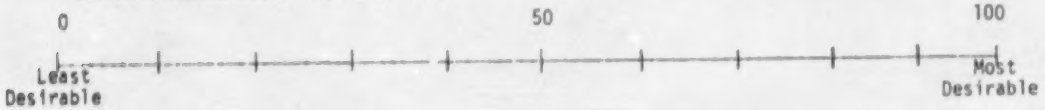

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CARD 06

CARD 07 11-12/ [3] 13-14/

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0 — 50 — 100

Least Desirable — Most Desirable

RATING

A. NHSC Scholarship [ ][ ][ ] 15-17/

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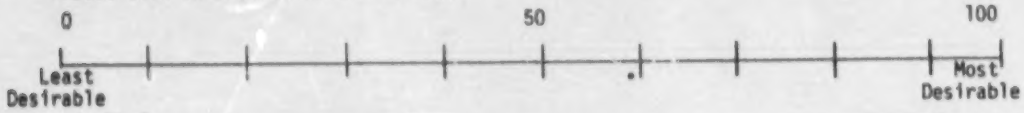

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CARD 06

CARD 07 11-12/ 2 13-14/

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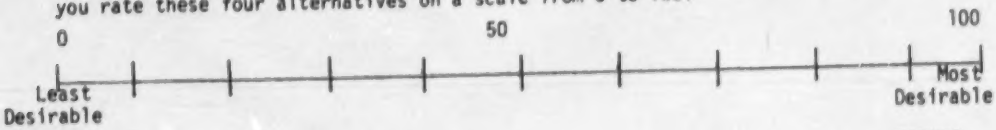

RATING

A. NHSC Scholarship ☐☐☐ 15-17/

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CARD 07

CARD 06 11-12/ [1] 13-14

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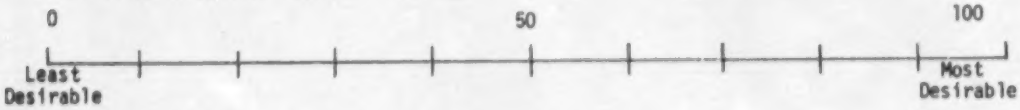

RATING

A. NHSC Scholarship [ ][ ][ ] 15-17/

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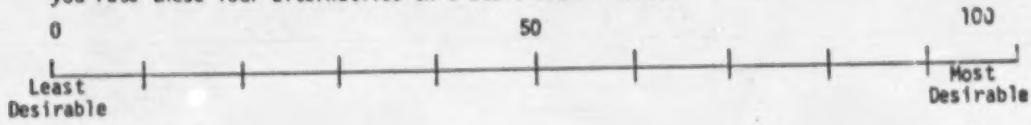

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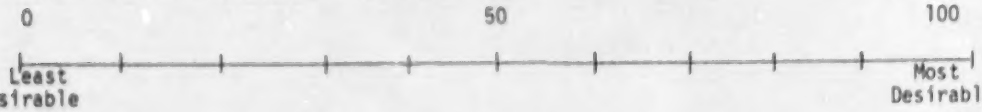

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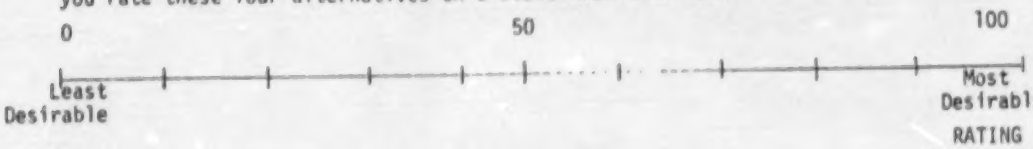

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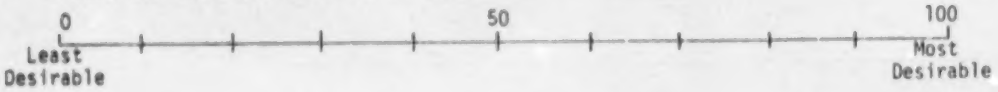

RATING

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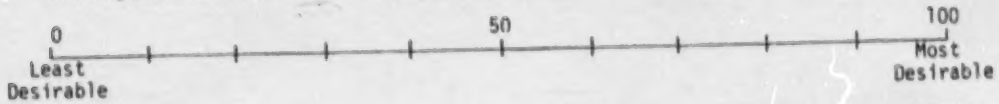

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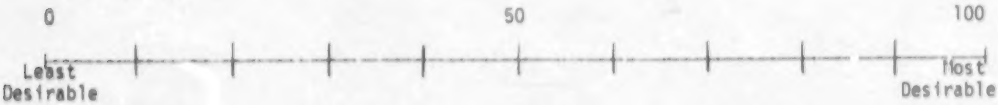

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- If those permitted to complete residency training were guaranteed the option of doing so in civilian programs? ___ 39-41/
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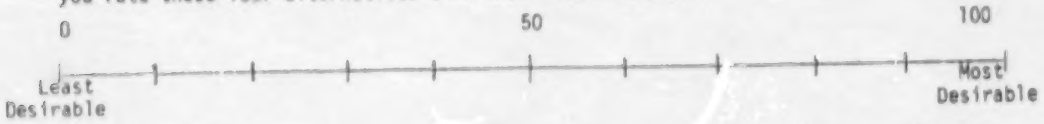

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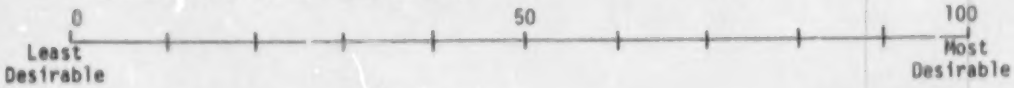

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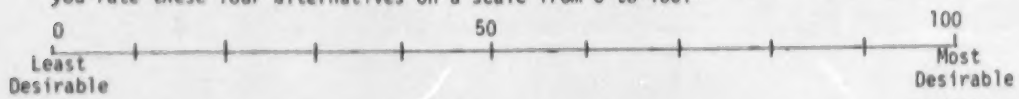

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- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? [ ][ ][ ] 39-41/
- If the monthly stipend were increased to $800 and the service compensation were increased to $37,000? [ ][ ][ ] 42-44/
- If the residency opportunity were 100% and the service compensation were increased to $29,000/year? [ ][ ][ ] 45-47/
- If the residency opportunity were 100%, the stipend were increased to $800, and the service compensation were increased to $37,000/year? [ ][ ][ ] 48-50/

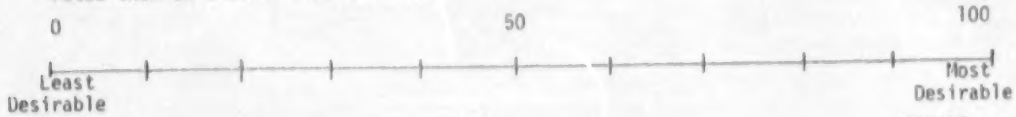
16. How would you rate the New Federally Insured Loan:

- If interest payments were deferred until graduation from medical school? [ ][ ][ ] 51-53/
- If interest payments were deferred until 3 years after medical school? [ ][ ][ ] 54-56/

CARD 07

CARD 06 11-12/ [8] 13-14/

9. Consider the three programs for financing your medical school education described on the opposite page and the way you are financing your medical school education this year (76-77). Assume that you were eligible and that each of these alternatives had been available to you at the beginning of this academic year. How would you have rated them on a scale from 0 to 100?



RATING

A. NHSC Scholarship [ ][ ][ ] 15-17/

B. Armed Forces Scholarship (AFHPSP) [ ][ ][ ] 18-20/

C. New Federally Insured Loan [ ][ ][ ] 21-23/

D. Your present method of finance [ ][ ][ ] 24-26/

How would your ratings in Question 9 change if the following modifications in the respective programs were made? Please consider these changes individually and make your ratings relative to those in Question 9. (*Ratings may exceed 100!*)

10. How would you rate the NHSC Scholarship?

- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? [ ][ ][ ] 27-29/
- If the monthly stipend were increased to $600 and the service compensation were increased to $29,000/year? [ ][ ][ ] 30-32/
- If the 3 year limit on post graduate training were removed, the monthly stipend were increased to $800, and the service compensation were increased to $37,000/year? [ ][ ][ ] 33-35/
- If the 3 year limit on post graduate training were removed and the monthly stipend were increased to $800? [ ][ ][ ] 36-38/

11. How would you rate the AFHPSP Scholarship?

- If the monthly stipend were increased to $800 and the service compensation were increased to $29,000/year? [ ][ ][ ] 39-41/
- If the residency opportunity were 100%, the service compensation were increased to $37,000/year, and your assignment to active duty in a geographic area were made through a matching program like that now used for internship and residency positions (the NIRMP)? [ ][ ][ ] 42-44/
- If the monthly stipend were increased to $600? [ ][ ][ ] 45-47/
- If the monthly stipend were increased to $600 and the service compensation were increased to $37,000/year? [ ][ ][ ] 48-50/

12. How would you rate the New Federally Insured Loan:

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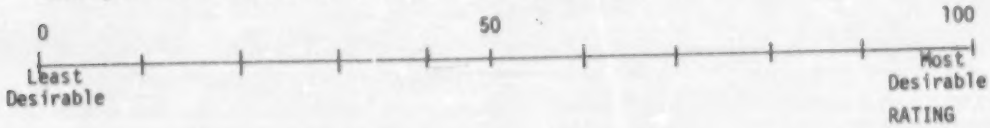
CARD 06

CARD 07 11-12/ [8] 13-14/

13. Now assume that each of the three alternatives for financing your medical education described again on the opposite page and your projected method of finance will be available to you for financing next year's medical school expenses (77-78). How would you rate these four alternatives on a scale from 0 to 100?



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CARD 07

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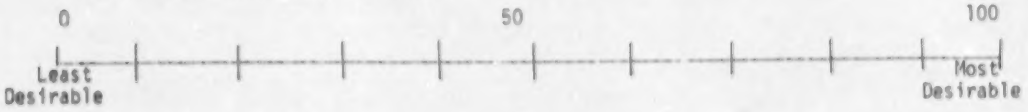

RATING

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C. New Federally Insured Loan ☐☐☐ 21-23/

D. Your present method of finance ☐☐☐ 24-26/

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CARD 06

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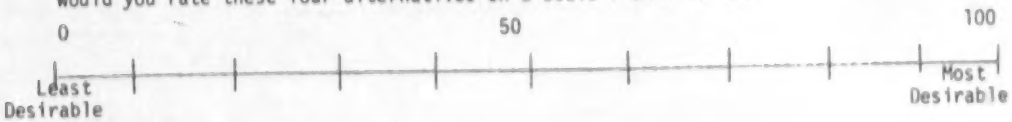

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CARD 07